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BIOLOGICAL ACTIONS OF DINITROPHENOL AND RELATED COMPOUNDS: A REVIEW

BY GEOFFREY EDSALL, M.D.*

WITHIN the last few years numerous investigations have been reported concerning the pharmacological actions of dinitrophenol, dinitro-ortho-cresol, and dinitro-alpha-naphthol (hereafter referred to as DNP, DOC, and DAN, respectively). As a result of this work the use of DNP and DOC has become widespread, both in the laboratory and in medical practice.

In connection with recent studies I have made a comprehensive review of the literature concerning the pharmacological, physiological and toxic properties of dinitrophenol and related compounds. The present report embodies a review of the main known actions of these drugs and is submitted for publication in the belief that it may also be useful to others.

History. The effects of the administration of DAN to dogs were described in 1885 by Cazeneuve and Lépine[4], who observed that the animals developed vomiting, agitation, hyperpnea, and fever, followed rapidly by death and almost immediate rigor mortis. Similar effects from DNP were reported by Gibbs and Reichert[24] in 1891 and by other investigators[44, 65]. Industrial poisoning from DNP was recognized over thirty years ago[33], and was so prevalent during the Great War that a careful pharmacological study of the drug was begun[38, 49]. The many detailed studies from various laboratories that have been published in the last few years, however, have provided the basis for our present understanding of the action of these compounds.

Chemical Properties. 1:2:4—Dinitrophenol, the most important compound of the group, is a yellow crystalline powder melting at 114° C, soluble slightly in water but freely in the common organic solvents; being a weak acid, it reacts with $NaHCO_3$ to form a moderately water-soluble salt[5, 26]. In solution DNP is yellow above, and colorless below, a pH of 2.5.

DAN and DOC differ chemically from DNP only in minor respects; certain other cyclic compounds have biological properties similar to those of 1:2:4—DNP[42, 58], but they present no known features warranting special discussion. These drugs may be administered orally, or, as the sodium salt, by any parenteral route, and may also be given in oil intramuscularly. Given orally the drug acts less rapidly and uniformly than when administered parenterally, but the gradual response obtained orally is preferable for clinical use, and often for experimental work.

Physiological Action. The drugs under consideration have been found to differ in their action only quantitatively; hence they will be discussed together. Numerous more or less conflicting observations have been reported by different workers, but these can usually be explained by variations in the dosage, mode of administration, nature and condition of the subject, etc. It is generally agreed, however, that the basic action of these drugs is always an *acceleration of tissue metabolism,* that is, an increase in oxygen consumption of aerobes, or CO_2 production of anaerobes. The other major phenomena observed, such as hyperpnea, vasodilatation, fever, hyperglycemia, are secondary to this metabolic stimulus. Certain manifestations, such as gastric irritation, dermatitis, or cardiac depression are toxic effects of a non-specific nature.

The increase in basal metabolism is the earliest detectable effect of DNP, appearing within one or two, to fifteen minutes, depending on the method of administration. After single doses the metabolic rate reaches a peak within about an hour, holds this level from twelve to twenty-four hours, and gradually returns to normal within the next twenty-four or so[5, 52]; the response to a given dose may vary considerably from day to day in the same subject[14, 52]. With basal metabolic rises of less than about 40 per cent there is little reaction except peripheral vasodilatation, and a slightly increased respiratory minute volume. Large doses, which may raise the metabolism to more than ten times the normal basal rate[29], produce the typical syndrome described above, which is essentially a metabolic rise so rapid and extreme that the heat production outstrips heat dissipation and the subject may soon die of the ensuing hyperthermia. This hyperthermia, which is not noticeable when small doses are given, is, with larger doses, preceded by the use of every available means of dissipating heat; horses and men perspire profusely, dogs pant out of all proportion

*Edsall—For record and address of author see "This Week's Issue," page 462.

to their increased oxygen needs, rodents salivate excessively and spread themselves out, and birds fluff out their wings in a similar effort to increase heat radiation. Likewise, the metabolic increase produced by febrile doses is far in excess of that which could be ascribed to the fever alone[29]. Indeed, if the animals are adequately chilled, their body temperatures may be kept within normal ranges, but the metabolism rises and death is almost as frequent and rapid as in the unchilled controls[39, 57]. Thus, the fever appears to be a consequence rather than a cause of the metabolic increase. The increased heat production is not of central origin, being independent of anesthesia[39, 57, 61], spinal transection[39, 57], or the presence of a heat-regulatory center[39, 57]. It is not dependent on muscular contraction[39, 58], and is unaccompanied by any marked muscular excitation, The fever is likewise independent of the presence of the viscera, the thyroid, or the adrenals[39, 57], and is not influenced by the administration of ergotamine, which abolishes the metabolic effect of adrenalin[46, 57]. The body temperature rise has been found to appear first in skeletal muscle, second in the intestines[39]. Peristaltic action is not increased, however, by DNP[58].

Metabolic increases have been obtained in various preparations of isolated tissue perfused with suitable concentrations of DNP; the increase in frog's muscle may be as high as eight times the normal, while increases of from 30 to 80 per cent have been found in liver, nerve, kidney[12, 17, 19, 39, 63, 64]; excessive concentrations of DNP, however, result in decreased oxygen consumption. On the other hand, Muntwyler[18] found no increase in the "oxygen uptake" of the livers of dinitro-phenolized rats. It has recently been found[11] that tumor tissue metabolism is increased by DOC.

Though some observers have found no stimulus to plant tissue metabolism obtainable with DNP[23, 57], others have demonstrated definite increases[17, 50]. A recent study[20] furnishes evidence that the biological potency of DNP may depend on the concentration not of total, but of undissociated DNP, which, in turn, varies inversely with the pH of the preparation.

The mechanism of the stimulus to tissue metabolism which results from the administration of these drugs has not yet been adequately studied. The metabolic rise is evidently unrelated to the glutathione content of the tissues[47]. It appears likely, indeed, that DNP is itself, like glutathione, a respiratory ferment, perhaps the most potent one yet discovered. It is consistent with this hypothesis that the effect of DNP, in a perfusion preparation, may be temporarily abolished by cyanide, the metabolic stimulus reappearing as the cyanide effect wears off[63]; thus, DNP is no antidote to cyanide poisoning[58, 61]. DNP cannot be regarded simply as an oxygen-transfer catalyst, however, since in isolated muscle it produces glycolysis in excess of oxygen consumption[17].

Biochemical Effects. The metabolic rises occasioned by the nitrophenols make proportionate demands upon the fuel reserves of the organism, the most evident of which is a mobilization of carbohydrate. With moderate metabolic rises in the range of 30 to 40 per cent, there is no hyperglycemia in animals[41], or in man[16]. Larger doses cause, in animals, a rise in blood sugar to three or four times the normal, and a rapid depletion of liver and muscle glycogen[29, 41]. Muscle lactic acid rises[3, 61], but blood lactic acid mounts only when anoxemia supervenes[29]. Blood and muscle phosphates rise[61] to double their normal values, and muscle phosphagen diminishes[47]. Starvation may result in less hyperglycemia[10] or even in a decreased toxicity and mortality, the opposite result being obtained by high carbohydrate feeding[53]. Insulin hypoglycemia has no appreciable effect[61] while the administration of glucose with insulin increases the mortality[58]. Other attempts to increase or decrease carbohydrate metabolism have had little influence on the reaction to DNP[31, 53, 58]. Finally, diabetic dogs respond to a given dose of DNP with a normal increase in metabolism and fever, but die before these have reached values lethal for normal dogs[56] and without any consistent change in blood pH; this hypersusceptibility has not been explained.

Though carbohydrate is evidently an important factor in the response to DNP, there is considerable indirect evidence that fat is involved as well, some observers having found increased blood fats[3] and lowered R.Q.'s[16, 29] in acute DNP intoxication; it has also been calculated that the total carbohydrate which disappears accounts for less than half the oxygen consumed[29]. Contrary results, however, are reported[41]. Nitrogen metabolism is not increased after either small or large doses of DNP[8, 16, 29, 41], except possibly after prolonged administration[41]. Since no adequate metabolic studies have been reported as yet, one cannot generalize concerning the nature and partition of the metabolic increase caused by DNP; but it seems reasonable to assume that it is similar to that occurring during a normal physiological increase in metabolism[8, 29].

Electrolyte and Water Metabolism: Though the blood may not be concentrated at the height of the febrile response to DNP[57], nevertheless the hyperventilation and perspiration may result in a considerable loss of water from the body, sufficient to cause great concentration[59] or even suppression[49] of urine. In extreme cases the dehydration may be aggravated by vomiting and diarrhea. Polyuria, on the other hand, has been reported in mild chronic intoxication[41]. It is apparent that a disturbance in water balance

may readily be induced by DNP administration. No satisfactory studies of total acid-base balance have been reported; ammonia excretion may rise in chronic intoxication, and decrease again as death approaches[11]. Blood calcium has been found to undergo no change[61].

Oxygen Transport, Gas Exchange. The greatly increased oxygen needs of the tissues may result, in some cases at least, in a greatly augmented A-V difference[29]; with extreme oxygen demands the arterial oxygen saturation may fali below normal[29] as is suggested also by the cyanosis observed in some cases of human poisoning[49]. The tremendous hyperpnea associated with the great increase in gas exchange results in some instances in an alkalosis due to uncompensated CO_2 deficit[58]; on the other hand, in extreme intoxication acidosis has been observed, apparently due to accumulation of unoxidized lactic acid[29]. The recent report of a patient dying in acidotic coma, following ingestion of therapeutic doses of DNP[43] can hardly, however, be explained on such a basis.

Unlike many other nitrophenols, 1:2:4—Dinitrophenol does not form methemoglobin[33, 45]. Cases of agranulocytosis following DNP administration have recently been reported, however[9, 32].

Respiration, Circulation. The administration of DNP increases the depth and rate of respiration primarily because of the needed increase in gas exchange, but also on account of the need for increased heat elimination, which, in the dog and some other animals, is accomplished largely through the lungs. Thus small doses of DNP may produce no visible hyperpnea, whereas large amounts of the drug may increase the respiratory minute volume ten or twelve times. The respiratory rate in human beings has been observed to increase to fifty-six respirations per minute after an overdose of DNP[51]. Morphine counteracts this hyperpnea somewhat, but other sedatives are without effect; conversely, DNP counteracts the respiratory depression of various sedatives[58]. Death is usually initiated, however, by respiratory failure.

Following small doses of DNP there are no significant circulatory changes, the pulse rate remains virtually unchanged even with metabolic rises of 50 per cent[5, 15, 37]; febrile doses, however, induce a tachycardia which is roughly proportional to the degree of fever[57]. Massive intravenous doses, on the other hand, result in progressively increasing bradycardia[24, 57], with a falling blood pressure and rapid cardiac failure.

Most observers find no characteristic change in blood pressure; there may be a temporary initial drop, associated perhaps with the early peripheral vasodilatation[30]. Tainter et al.[59] report moderate reduction of hypertension in seventeen obese patients following a course of DNP therapy.

Cardiac minute volume studies on a few animals with severe DNP intoxication showed, in some cases, increases up to from three to four times the normal[29]. Studies of the "arm-to-tongue circulation time" have so far shown no definite correlation with metabolic changes induced by DNP administration[25, 55]. It is of interest that Tainter et al.[59] found apparent relief of angina pectoris in three patients, following administration of DNP.

Toxicology, Pathology. DNP is stored to some extent in most tissues[27] and, even in small doses, may produce a yellowish discoloration similar to that of jaundice. The yellow color in the serum disappears on the addition of one to two drops of 0.1N HCL to the sample, thus differing from real icterus[59]. DNP is excreted freely through the kidney, either as such or in the form of various partial reduction products. The presence of any of these compounds in the urine, serum or tissues may be determined by various tests described in detail elsewhere[1, 26, 33]. Judging from the metabolic response, DNP appears to be eliminated entirely within three or four days; in the presence of liver or kidney damage it is possible that the drug will be retained over longer periods.

Toxic doses of the dinitro-compounds vary greatly, not only for different species but for different individuals of the same species[5, 33, 62]. Numerous estimates of the fatal dose have been made for various animals[1, 29, 39, 58, 61], but no adequate estimate of the minimum fatal dose for man is available. A single dose of 10 mg. per kilo produces fever in some individuals[5], and a case was reported recently, where death followed the ingestion of 8.5 mg. per kilo per day for five days, the maximum being 10.7 mg. per kilo for the last two and a half days[51]. Thus, doses of 10 mg. per kilo or more may for the present be regarded as potentially fatal to man. From experimental data it would seem that DOC was metabolically more potent, and DAN less potent than DNP.

As indicated above, DNP may cause death by several mechanisms[4, 57]: massive doses may result in cardiac failure; large doses kill essentially by hyperthermia; and some individual cases appear to die primarily from acidosis. The hyperthermia is by far the most common and important cause of death.

Due to the great variation in dosage, rate of absorption, and susceptibility of subjects, postmortem findings differ widely both in animals and in man. In animals there have been reported no pathological changes[30], visceral congestion[4], fatty infiltration of the liver[40], generalized congestion, fatty infiltration of liver, and degeneration of renal tubules[33]. Tainter and Cutting[58] who found no liver pathology in their dogs, report cloudy swelling of renal

tubules, and large areas in the spleen where the lymphocytes are replaced by more or less homogeneous material, in which are "numerous large faintly staining cells with vesicular polyhedral nuclei". Human postmortem examinations have usually revealed only pulmonary edema[49]; in two recent cases, however, there were found widespread congestion, with scattered ecchymoses in various organs, pulmonary edema, fragmentation of the heart muscle, separation of liver lobules, and various stages of renal tubular degeneration[51, 60]; the picture was said to resemble heat stroke. A recent fatal case from DOC, however, exhibited only pulmonary edema, and intense edema and congestion of the brain[34].

What pathological changes may result, in man, from repeated small doses of DNP, is not yet known. In patients receiving therapeutic doses of the drug, routine examination of the urine, van den Bergh tests, etc., have so far been negative[59]. It is obvious, however, that this constitutes no proof that the drug given in moderate doses will cause no liver or kidney damage. Looney and Hoskins[37] found a transitory rise in blood NPN, and a rather persistent rise in blood uric acid, when therapeutic doses of DNP or DOC were administered. Since nitrogen excretion rose simultaneously, however, these changes in the chemical constituents of the blood were not considered definite evidence of renal impairment.

Clinical Effects. With doses of from three to five mg. per kilo per day, human basal metabolism may be raised to 25 or 50 per cent above normal without any symptoms other than a transitory feeling of warmth, a not infrequent sense of increased well-being, sometimes amounting to euphoria, and some increase in perspiration. Tainter et al. suggested the use of the drug in the treatment of obesity, and have reported 113 cases so treated[59]. In the large majority of these cases, weight losses were obtained averaging two to three pounds a week, on an average daily dose of 225 mg. of DNP and with no restriction of diet. Many patients had proved resistant to further weight reduction by other means. Less satisfactory weight losses have been reported by other clinicians[16], but there is no doubt that the drug can be quite effective in the treatment of obesity. Its use for this purpose is already being advertised commercially, at least two proprietary forms of DNP having appeared on the American market ("Slendite" and "Dinitrofenol"), and a similar weight-reducing preparation of DOC ("Dekrysil") being for sale in Great Britain. Although nitrophenol compounds have been on the drug market only a few months, toxic and even fatal results have already occurred, in cases without adequate medical supervision[9, 34, 51, 54, 60]. A recent editorial in the *Lancet*[35] summarized the issue thus: "Is it justifiable in dealing with a condition which almost always responds readily to a little wholesome discipline, to employ instead a drug of unquestioned potency but uncertain toxicity?"

DNP does not favorably affect myxedema; the rise in metabolism is not accompanied by relief of the signs and symptoms of this disease[15, 16, 25, 52]. There is indeed, little similarity between the actions of thyroid medication and DNP, moderate doses of the latter producing none of the tremors, palpation, tachycardia, restlessness, nervousness and irritability so characteristic of the former; and the relationship of blood cholesterol to basal metabolism found in thyroid disease does not hold with DNP[6, 16, 25, 52]. Finally, the biologic actions of the two drugs are dissimilar, DNP having no effect on tadpole metamorphosis[7].

The effects of dinitrophenol have been studied in eighteen mental patients whose state was characterized by sluggishness, apathy and passivity[13]. After three months of medication with doses graded up to 5 mg. per kilo per day the symptoms in eight of these patients remained unchanged, in four they became definitely worse, while in six there was apparent mental improvement which persisted in three after cessation of medication. Since these six patients were all under thirty years of age and experiencing their first mental breaks, improvement could not safely be ascribed to the drug. Looney and Hoskins[37] found no definite improvement in the mental condition of ten cases of schizophrenia after seven weeks' administration of moderate doses of DNP or DOC.

The marked peripheral vasodilatation following administration of DNP has led to its trial in the treatment of peripheral vascular diseases, chronic arthritis, and other conditions wherein vasodilatation might be of benefit[2, 21], but the results cannot yet be evaluated.

Toxic Reactions, Fatalities. Deaths from industrial poisoning from DNP have been known for many years, but with modern precautions these have been almost eliminated. It is known, however, that the susceptibility of different individuals to DNP poisoning varies greatly, and that certain conditions—such as chronic alcoholism, liver or kidney disease, syphilis, malaria, tuberculosis and arthritis—apparently predispose to hypersusceptibility[19]. With the recent introduction of DNP as a therapeutic agent, a new risk has arisen and four fatalities have been reported in the last few months as a consequence. The mental patient previously referred to died after the dose had been raised to and maintained at 5 mg. per kilo per day for only five days; she died in coma, with a low blood CO_2 combining power, moderate fever, tachycardia, and falling blood pressure. Autopsy showed old tuberculosis of the lungs and mild cardiac valvular lesions; her death remains

unexplained. Two deaths from excessive use of DNP or DOC in evident disregard of specific instructions have been reported[34, 60], and such accidents will doubtless occur from time to time so long as the sale of these drugs to the public remains unrestricted. One fatality, however, has followed the administration of approximately 10 mg. per kilo per day of DNP for only two and a half days[51]; thus it is apparent that the fatal dose for certain individuals may not be appreciably greater than the usual therapeutic dose.

The commonest idiosyncrasy to DNP is a dermatitis medicamentosa, reported in Germany among industrial workers[18, 33], and occurring in 7 per cent of Tainter et al.'s cases[59]. Anderson et al[1] reported a similar case, and Frumess[22] observed an anaphylactic type of reaction. All these cases have cleared up within a few days after medication was stopped. Six of Tainter's patients, three of whom were in one family, lost the ability to distinguish salt from sweet; four recovered while continuing medication, while two felt obliged to discontinue the drug.

One patient has developed jaundice, a tender abdomen, and pains in the legs, after receiving 3 mg. per kilo of DNP for five days[28]; recovery was rapid on withdrawal of the drug, but it is hard to judge whether this was a true case of toxicity, since no distinction was reported between DNP pigmentation and genuine icterus. A case recently reported[54] developed a dermatitis, followed by severe, prolonged jaundice and enlargement of the liver, after two weeks on 400 mg. per day of DNP in the form of "Slendite."

A case of chronic middle ear infection, following administration of 300 mg. of DNP once a day for five days[10] appears to have resulted largely from the excessive vascular congestion produced in this patient with this dose. The occurrence of agranulocytosis in patients receiving DNP has been mentioned previously.

The symptoms of overdosage are various, but usually characteristic. Mildly toxic doses cause, according to Koelsch[33] "headache, lassitude, diminished physical endurance, a tendency to perspire, especially at night, giddiness, and tinnitus"; of these the excessive perspiration is usually the most prominent feature. Cramps in the abdomen, pains in the extremities, and digestive disturbances may also appear. Large doses cause restlessness and agitation, cachexia, dyspnea, and fever. Obviously the production of any sustained rise in body temperature, or any perceptible dyspnea, indicates overdosage. To avoid this possibility, it would seem advisable not to give doses producing basal metabolic rises of more than about 40 per cent.

Masserman and Goldsmith[43] regard lassitude, falling blood pressure and a sustained, though moderate tachycardia, as indicative of overdosage; this syndrome has not been reported elsewhere.

Treatment. There is no specific antidote to DNP, and general treatment is unsatisfactory. Cold tub-baths may help, and dehydration can be corrected by the parenteral administration of large quantities of normal saline solution. Morphine, by combating restlessness, helps diminish the already excessive metabolic load. Salicylates or quinine may possibly be of value[58, 61].

Summary. 1. The biological actions of dinitrophenol and related compounds are described. It is shown that they act as accelerators of tissue metabolism. The pathologic effects of the drugs are discussed.

2. The clinical applications of dinitrophenol in obesity, myxedema, mental disturbances, and peripheral vascular disturbances are discussed.

3. The toxic reactions to the drugs are described, and the indications of overdosage specified. Palliative measures for dinitrophenol poisoning are suggested.

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CHRONIC EMPYEMA WITH BRONCHIAL FISTULA CURED BY TIDAL DRAINAGE

Case Report

BY PHILIP G. MC LELLAN, M.D.*

CHRONIC empyema complicated by bronchial fistula and collapse of the lung is by no means rare, and its treatment by ordinary operative procedures is attended with a definite mortality. Hedblom[1], in his monumental review of chronic empyema, recorded the early high mortality from such types of operations as those of Schede and Delorme and brought out the value of irrigations. His analysis of 150 cases of chronic empyema at the Mayo Clinic showed a mortality of 4 per cent from drainage operations, 5 per cent from decortication operations, 13.3 per cent from plastic operations, and no deaths from irrigation with Dakin's solution. He concluded that, "A major procedure is indicated only if non-operative or less extensive surgical treatment reasonably may be considered less effective."

Irrigation can be readily carried out in the presence of bronchial fistula if the tidal irrigation as devised by Hart is employed. The method has been adequately described elsewhere[2, 3, 4, 5]. The following case, in which this technique was carried out in detail, is reported because of the favorable outcome, accomplished with minimal risk and discomfort to the patient.

CASE REPORT

H. G., Union Memorial Hospital, Admission No. 17880.

History. A white girl of ten, following a bronchopneumonia eights months ago, had a trocar-cannula drainage for empyema done in the home. Drainage was unsatisfactory and intermittent after the first month. The child lost in weight and strength, the left chest became retracted and immobile, and she lost the use of her left arm.

Examination. An emaciated white girl of ten, obviously anemic and chronically ill. Clubbing of the fingers was moderate. The left chest was markedly retracted, the anterior posterior diameter being approximately one-half that of the right. The left shoulder was drawn forward and upward, and the sternoclavicular joint on this side dislocated. A chronic sinus was present in the left lower chest in the mid-axillary line, the surrounding tissues swollen but not tender. Breath sounds were suppressed on the left, the heart was displaced to the right, with the point of maximum impulse just to the left of the sternum. There was moderate elevation of the white blood count and a hemoglobin of 65 per cent. Urine examination was essentially negative. The tuberculin test was negative. Injection of methylene blue into the sinus resulted in the expectoration of the dye for two days following the injection. X-ray of the chest showed more fluid than a plate taken four months before. (Figs. 1 and 2.)

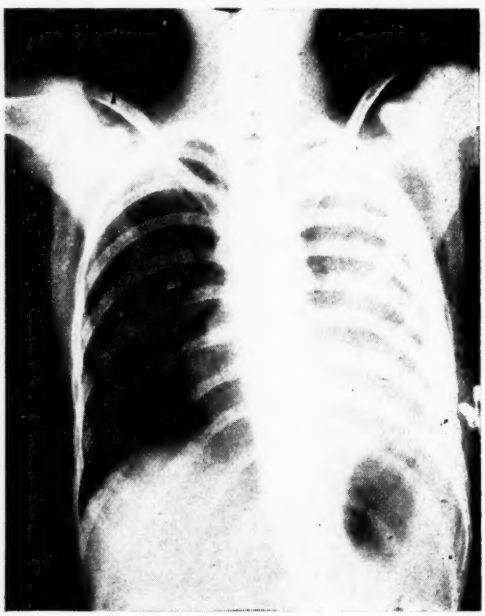

FIG. 1. 5/28/30. Chronic empyema left. Fluid; thickened hyperplastic pleura; suggestion of air in upper anterior left pleural cavity; displacement of the heart to the right; collapse of the lung and marked collapse of the rib interspaces on the left.

Eight months after onset of the empyema and three days after x-ray (fig. 2), tidal drainage was instituted. In the ward a light nitrous oxide anes-

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thesia was administered and a long Kelly clamp inserted into the sinus, opening up a large pus pocket. A fenestrated rubber catheter was forced well into the sinus by means of a stiff metal stilette, and the catheter connected with the Hart tidal irrigation apparatus. The sinus fitted very snugly about the catheter and there was no air leakage. Due to the presence of the bronchial fistula, a radiator connection was necessary to provide constant suction. The irrigating fluid used was physiological saline. The apparatus worked perfectly, and at the end of two weeks, the cavity contained only 9 cc.; at the

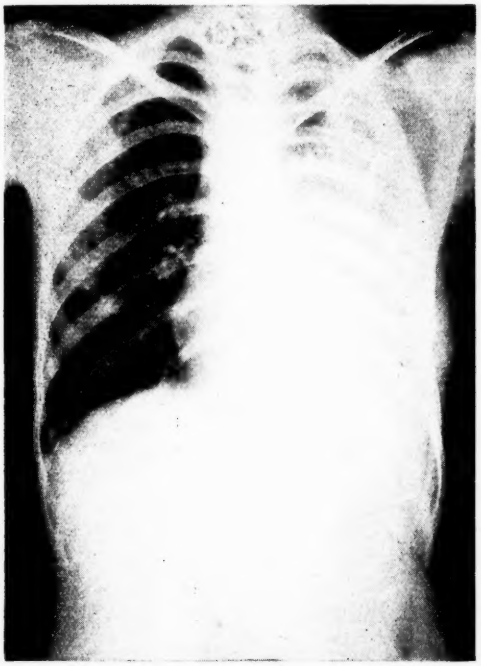

FIG. 2. 9/22/30. Three days before the institution of tidal drainage. No improvement over former plate; fluid increased.

end of three weeks, 7 cc. The tidal irrigation was then discontinued. At the end of four weeks the cavity contained only 2 cc.; and at the end of five weeks the sinus was healed over, the cavity obliterated, and the collapsed lung reëxpanded. (Fig. 3.)

Progress during the next month was remarkable, the child gaining twenty-three pounds in weight. Fifty-three days after the institution of tidal drainage, the patient was discharged from the hospital, with the wound well healed, and the left lung functioning. End result thirteen months later was a healthy child with practically normal chest findings. (Fig. 4.)

SUMMARY AND CONCLUSIONS

A case of chronic empyema with bronchial fistula of eight months' duration in a girl of ten was treated by the Hart tidal irrigation method and a cure resulted in five weeks after institution of treatment. End result thirteen months later showed excellent restitution of the lung function as well as that of the surrounding cage. The use of this method of treatment, especially in the presence of bronchial fistula, is worthy of trial before resorting to more radical forms of treatment and may, as in the case reported, result in cure without further treatment. As pointed out by Hart[5], in case complete cure is not obtained, the size of the cavity is so reduced, that a less extensive operative procedure may then be carried out on a patient much better able to stand operation.

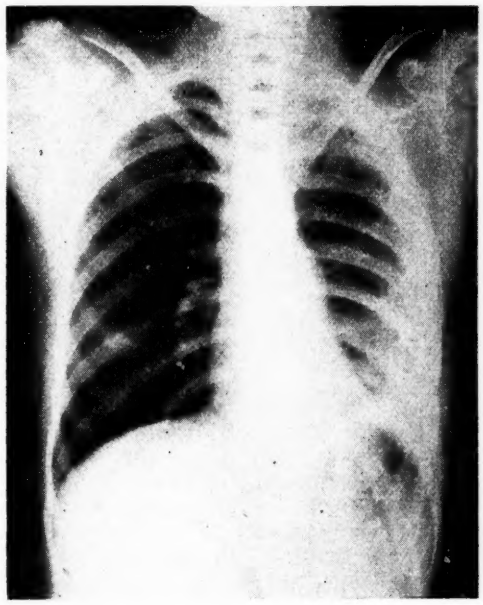

FIG. 3. 11/15/30. Two days after sinus healed. Heart back in normal position; the lung considerably reëxpanded; interspaces expanding; hyperplastic pleural thickening still present.

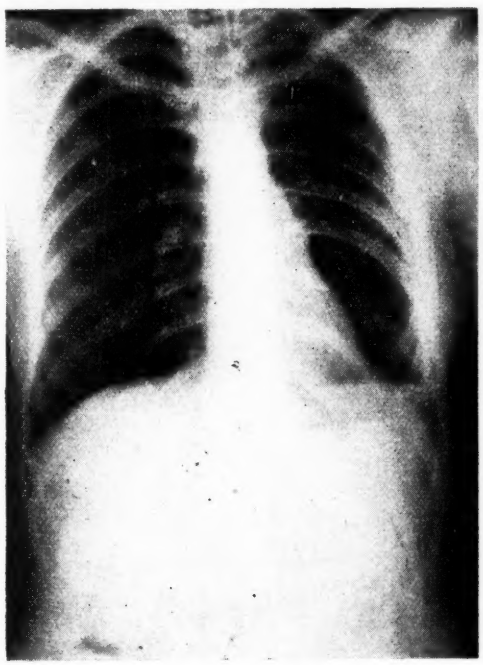

FIG. 4. 12/19/31. Thirteen months after healing. Lung completely reëxpanded; interspaces nearly normal; pleural adhesions to the diaphragm and thickened pleura.

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MANAGEMENT OF THE PATIENT WITH ANGINAL PAIN*

BY ROBERT L. LEVY, M.D.†

BY sheer force of numbers, if for no other reason, patients with cardiac pain command attention. This group of sufferers is steadily growing in size, due largely to the increasing incidence of affections of the coronary arteries[1]. To estimate the gravity of the condition which manifests itself by pain, is often difficult. To prognosticate accurately with respect to the probable duration of life is frequently impossible. And in the therapeutic management of these patients, the physician is called upon to exercise all that he has of resourcefulness and tact.

The anginal syndrome may be defined as discomfort referred to the sternum or precordial area, which recurs paroxysmally. In degree, this varies, in different individuals, from a mild sense of pressure to the most agonizing pain. Commonly, the sensation follows effort or emotion and subsides with cessation of the inciting cause; but there are instances in which it occurs also at rest. The pain may radiate upward, downward or laterally, into one or both arms. This vicinity of discomfort, occurring in attacks, must be distinguished from that induced by acute coronary obstruction, in which the paroxysm is more prolonged and does not recur in the sense here implied. In the discussion which follows, it is not proposed to consider the treatment of sudden occlusion of a coronary branch. The distinction between anginal pain due to coronary thrombosis and that resulting from other causes is usually readily possible.

CLINICAL ASSOCIATIONS OF CARDIAC PAIN

All pain is the symptomatic expression of a disturbed functional state. In order to proceed effectively with measures for its relief, it is essential to ascertain, in so far as possible, its cause. The mechanism by which pain arises in the heart is, as yet, but imperfectly understood. In the light of current knowledge, it is believed to occur when the heart muscle does not receive an adequate supply of oxygen. In the normal heart, there exists a ratio between oxygen supply and the capacity for work, which varies between certain physiological limits. This ratio may, conceivably, be disturbed in one of two ways, i.e., either by cutting down the amount of oxygen which reaches the heart muscle or by increasing the amount of work which the heart is called upon to perform. In either event, provided both factors do not alter proportionately, anoxemia of the myocardium results.

With this simple concept in mind, the following are some of the more important clinical conditions which may be responsible for a derangement in the balance between the supply of oxygen and the demand for it by the heart:—

1. *Disease of the coronary arteries.* This is the chief cause of anginal pain, for it induces a condition which properly might be called "coronary insufficiency". It may be due to:
   - (1) Arteriosclerosis.
     - A. Slight, with patchy intimal sclerosis.
     - B. Marked, with calcification, and narrowing or obliteration of the lumen.
   - (2) Syphilis of the aorta, with stenosis or occlusion of one or both coronary orifices.
   - (3) Rheumatic arteritis, a rarer condition.

2. *Aortic insufficiency*, regardless of etiology. It is believed that the lowered diastolic pressure which accompanies this valvular defect results in an inadequate blood flow through the coronary system.

3. *Anemia.* The heart suffers from anoxemia along with the rest of the body.

4. *Hyperthyroidism.* The increased metabolic demands of the body require an increased velocity of blood flow and an augmented volume output by the heart. The added demands placed upon the myocardium may be greater than its capacity to increase its supply of oxygen.

5. *Paroxysms of tachycardia.* Again, the rapid rate may call for a greater coronary flow than can be delivered.

6. *Combined states.* For example, marked anemia occurring in an individual with coronary sclerosis will induce pain more readily, as a rule, than in a person with normal coronary vessels.

Paroxysms of pain referred to the chest may be observed under other circumstances, and sometimes simulate the discomfort resulting from anoxemia, though not the result of it. Differential diagnosis is important, both for prognosis and therapy. Some of the conditions which may cause confusion are the following:

1. Psychoneurotic states.
2. Poisoning by tobacco or coffee.
3. Aneurysm of the aorta.
4. Pericarditis.
5. Arthritis of the spine, with resultant intercostal neuralgia.

It is readily apparent that attacks of discomfort referred to the sternum or left side of the

*Read before the Hartford Medical Society, April 2, 1934.

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chest occur in association with many different clinical states. The mere description of the complaint by the patient does not serve to distinguish the nature of the basic disturbance. The "angina pectoris" of Heberden is not, then, a disease in the accepted sense, but a symptom whose cause must be carefully sought before treatment can be undertaken with reasonable hope of success.

THE APPROACH TO THE PATIENT

Any individual who has a pain in the region of the heart is alarmed. He thinks immediately of some acquaintance or relative who has died suddenly following a similar complaint and his first question is apt to be: "Have I angina pectoris?" He wants, above all, reassurance. It is my practise, under these circumstances, to state at the outset, that there is no such disease as angina; that this term means merely a painful or uncomfortable sensation in the chest, and that it will be our aim to discover the nature of the condition which lies at the basis of the discomfort.

The diagnosis and estimation of the gravity of the situation will depend largely upon a carefully taken history. Notation of the normal habits of the individual with respect to work, recreation, sleep, food and exercise are essential, for they may require modification. Of particular significance is the patient's response to effort, in relation to his pain. Almost invariably, the same activities or series of events, if repeated day after day, result in the same type of discomfort. Minor inconsistencies in this relationship do occur as the result of modifying factors, such as fullness of the stomach or chilling. But when there are major discrepancies between inciting cause and painful response, the fault usually does not lie in the heart.

A complete examination, including electrocardiogram, x-ray and fluoroscopic examination of the heart, blood count and Wassermann test, serves further to determine the etiology and to define the nature and extent of the structural changes. When there is any question of thyroid dysfunction, the metabolic rate should be determined. In the presence of rheumatic heart disease, the rate of sedimentation of the red blood corpuscles may help in distinguishing between an active and an inactive lesion. At the conclusion of the survey, the patient should have the feeling that his condition has been thoroughly investigated. In the final analysis, the best estimate of the degree of functional derangement is obtained from the patient's own story.

The second question which naturally follows closely after the first is: "What is my outlook for the future?" There are rare individuals who really desire a frank statement of the whole truth. But as a rule, even those who stoutly assert that they "want to know everything" prefer to hear an encouraging report. To dodge the issue or to lie, is neither advisable nor necessary. A part of the truth, tactfully presented in simple language, is often all that is necessary to allay fear. It is fair to say that all of us, after the age of forty, are subject to changes in the arteries, which manifest themselves by loss of elasticity and the appearance of fatty or even chalky deposits. Such alterations may take place in the vessels of organs or tissues without interfering with function. If, however, there is hardening of the arteries of the heart, discomfort may ensue, even though the lesion is slight. There need be no discussion of a sudden accident with the patient; but a responsible member of the family should be fully informed as to the possibilities.

MANAGEMENT OF THE PATIENT

Where specific therapeutic measures are indicated, as for example, in syphilis or anemia, the problem of treatment is clearly defined. But by far the greatest number of those who seek relief because of anginal pain are men between forty-five and sixty years of age, in whom sclerosis of the coronary arteries is the source of the trouble. To modify existing lesions or to arrest the progress of arteriosclerosis, are accomplishments as yet beyond our powers. For the most part, therefore, it must be our endeavor to manage the patient rather than to attempt to treat his disease. With his coöperation, there must be worked out a regimen which will make for comfort, for as much activity as possible and for the prolongation of life.

Attention to detail is imperative and determines, in large measure, the success or failure of the undertaking. Each individual presents his own peculiar problems, according to his temperament, station in life and daily habits. It is necessary, in spirit, to arise with him in the morning, go through a typical day and see him through a night's rest, in order to guide him in his course of action.

In his activities, the patient must aim to live within the limits of his pain. Moderation is the watchword; but he should be permitted to have as full a life as his disability will allow. There are many men active in business or one of the professions who have carried out their best work after the onset of cardiac discomfort. Often, friends and associates are unaware of any limitations. A rest on a couch in the office, after lunch, may serve to break the day and enable a man to continue with the work of the afternoon. The ascent of stairs, where possible, should be avoided, for stair-climbing places a sudden demand upon the circulation. If a flight must be taken, it is well to have the patient pause between each tread.

It is folly to forbid all exercise and the amount possible will vary in each instance, as well as

in the same person at different stages of his illness. Violent games, such as squash or tennis, are not apt to be attempted because of their unpleasant effects. Golf on a level course, and horseback riding, are often possible when the myocardium is not severely damaged. It is well to advise the avoidance of any form of exercise for relaxation, when already fatigued. Light general massage and resistance gymnastics, according to the Schott method, may be tried in those who, by nature or force of circumstances, are physically indolent.

The choice of occupation for patients who have gained a livelihood by manual labor presents a problem in sociology and economics, as well as one in medicine. With the severe grades of pain, the sufferer simply cannot carry on. Jobs as elevator operators for such as these are always at a premium. When the intellect permits, clerical work is sometimes possible. A traveling salesman can often be of use in the home office. A complete change in the character of occupation is difficult, particularly in these days of depression and unemployment. Where total disability exists, one of the surgical measures, later to be referred to, may be undertaken.

The control of diet is sometimes the keynote of a successful regimen. Almost invariably, the patient will volunteer the information that he is more subject to attacks after a meal. The stomach should never be overloaded, and five small feedings are preferable to three large meals. If there are nocturnal attacks, the evening meal should be light, and taken early, with dinner in the middle of the day. The specific articles to be taken will vary with the nationality and social status. Flatulence, above all else, is to be avoided. The older writers all stressed this point, and they were right. The members of the cabbage family, including brussels sprouts and cauliflower, as well as corn and cucumbers, are taboo. Sweets and starchy foods should be taken sparingly. If diabetes or gout is present, suitable modifications must be made to care for these metabolic faults. Insulin, if necessary for the control of hyperglycemia, must be given with caution, for it causes an increase in the work of the heart and may induce an anginal paroxysm. Many of the older diabetics, in whom coronary sclerosis is marked, do better without insulin even though their urine shows a faint reducing reaction and the level of the blood sugar is slightly elevated. The obese must be taught to reduce, but gradually and, above all, without the use of thyroid extract.

Climatic influence cannot be disregarded. Many of these patients are more subject to attacks in the cold weather and, in the winter, fare better in a warmer atmosphere. Some, who can arrange to do so, prefer to live where the weather is more equable and temperate, as in California. To walk in the face of a blasting wind is to invite disaster.

At least eight hours in bed, at night, should be insisted upon. An occasional day or half day in bed is often useful in building up reserve. In the severe cases, a week or two spent in bed may result in permanent betterment.

Before the interview has proceeded very far, the use of alcohol, coffee and tobacco will come up for discussion. Alcohol is sometimes helpful in relieving a paroxysm. Its continued use, in moderation, is often beneficial rather than harmful, for it induces peripheral vasodilatation and relaxation. In the obese, indulgence must be curtailed. A cup of coffee in the morning frequently acts as a bracer, and unless it is followed by discomfort, is to be allowed. A cup of weak tea in the afternoon likewise serves as a "pick-up" for some. The attitude which the physician takes toward tobacco will vary. In general, patients with anginal pain are better off without it. For many, it is a poison and its use results in increase in the frequency and severity of attacks. There are those, however, who derive real comfort and emotional stability from smoking. In them, curtailment is urged and the de-nicotined cigars and cigarettes may be tried. The value of the de-nicotining process is open to question; but the patients themselves not infrequently think that they can smoke such brands with comfort whereas ordinary varieties are less well borne. Perhaps the reason for such experiences lies in the fact that the de-nicotined products, especially the cigars, contain milder tobaccos.

The cultivation of an even temper is helpful. It was John Hunter who was accustomed to say that "his life was in the hands of any rascal who chose to annoy and tease him." And he died at a board meeting in St. George's Hospital following a fit of anger. Card playing, even for small stakes or for none, may cause pain in the emotionally susceptible. A tranquil bearing in the contacts of daily life can be achieved with the exercise of conscious effort. For those who suffer from nocturnal attacks, a quiet hour before retiring aids in securing undisturbed sleep.

There are, on occasion, reflex factors which tend to lower the threshold of the heart for pain. Chief among these is chronic cholecystitis, either with or without stones. The removal of the infected gall-bladder may result in reducing both the number and severity of the attacks. I have recently seen two instances in which duodenal ulcer was present in patients who presented unmistakable evidence of coronary disease. In them, the anginal pains were much diminished by the institution of a Sippy régime, helped, no doubt, by a period of rest in bed. Constipation, both because it induces straining at stool and makes for the accumulation of the products of intestinal putrefaction, should be controlled by

diet, as well as laxatives when necessary. Foci of infection in the teeth, tonsils and sinuses, in my experience, have seemed to play an insignificant rôle with respect to anginal attacks. On general principles, infected teeth, though not necessarily all dead teeth, should be extracted. In using a local anesthetic for this purpose, the dentist should be instructed to omit epinephrin from the solution which he injects, for it may readily induce a paroxysm. Tonsillectomy in patients with coronary disease, especially in the elderly, should be approached with caution and done only when the indications for it are urgent. Likewise, in treating chronic sinusitis, conservative measures should be given preference.

The well-to-do patient is prone to favor a sojourn at a Spa, usually in the course of a trip to Europe during the summer months. I have never been able to convince myself that the medical measures carried out in these health resorts are superior to those commonly employed at home; nor that the various hydrotherapeutic procedures so frequently stressed produce any effect other than the induction of temporary peripheral vasodilatation. Perhaps the latter is desirable. On the other hand, I am frank to admit that several weeks spent at such an establishment often prove beneficial. The patient is away from home and free of care. The surroundings are pleasant and there is good music to be heard. The day is planned with proper regulation of activity and rest. The food is simple but well prepared. There are waters to be drunk which exert a mild laxative action. A pilgrimage has been made in the company of others. All these factors combine to react favorably upon one who is in a receptive and impressionable mood.

DRUGS

An attack will sometimes subside within a few minutes following the cessation of activity or the calming of an excited nervous system. Nitroglycerine, upon which the sufferer soon learns to depend, was first used as a remedy for anginal pain by Murrell in 1879. In one per cent alcoholic solution he gave it to three patients who experienced great relief. It is more conveniently carried as a tablet, which should be thoroughly chewed before swallowing. A small dose (1/200 or 1/150 grain) often suffices and does not induce the flushing and headache which may follow the larger and more commonly used 1/100 grain tablet. It is important to insist that nitroglycerine tablets be fresh and that they be used within two months of the date of manufacture. After the expiration of six to eight weeks, their strength deteriorates. It would be well if the bottles containing such tablets were dated by the commercial drug firms. The odor of amyl nitrite, in the form of "pearls", makes it less popular than the nitrite in tablet form. When the attack persists for more than thirty minutes and is not relieved by nitrites, particularly if this is contrary to previous experience, occlusion of a coronary branch should be suspected.

The value of nitroglycerine as a prophylactic is not sufficiently appreciated. It was Professor K. F. Wenckebach, of Vienna, who first called my attention to its use in this manner. If a tablet, or if necessary, two, be taken prior to anticipated physical activity or nervous strain, the effort can often be carried through to a painless conclusion. In this way, an executive may be enabled to preside at a board meeting, a lawyer to plead in court or a salesman climb an unavoidable flight of stairs. There is no harm in repeating the dose several times in the course of a day, if occasion demands it. The regular use of the nitrites, particularly those having a more prolonged action, such as erythroltetranitrate, is not to be recommended. The results are not so satisfactory as when necessity or prevention are the indications employed.

Other drugs should be administered with a clear idea of what they are expected to accomplish. When congestive heart failure is present, digitalis, along with other appropriate measures, is employed. In some patients with enlarged hearts and a small cardiac reserve, the continued daily use of a maintenance ration, as emphasized by Christian, is often helpful in preventing frank cardiac insufficiency. In certain instances, on the other hand, digitalis appears to aggravate the severity of the pain and to cause more frequent recurrence of paroxysms. Under these circumstances, obviously, it must be discontinued.

Mild sedatives, by producing a more equable state of mind and by lowering the threshold for pain, are frequently beneficial. Phenobarbital or the bromides serve well in this capacity and may be given, in small doses, continuously or intermittently, over long periods of time. A soporific at bedtime may avert nocturnal seizures; and a drink of spiritous liquor before retiring sometimes accomplishes the same end.

Various preparations have been tried which are said to induce dilatation of the coronary arteries and thereby augment the flow of blood through the heart muscle. Of these, aminophyllin (theophyllin-ethylene-diamin) has enjoyed the widest popularity, and certain patients claim that they feel better when taking it. In a dose of 0.1 Gm. (1½ grains), it is dissolved in water, and is taken three or four times daily. Theobromin, theophyllin-calcium-salicylate (phyllicin) and theobromin-calcium-salicylate (theocalcin) have also been used. In my hands, various organ extracts, such as those marketed under the trade names of "myorgal", "padutin" and "angioxyl" have proved worthless.

The number and intensity of anginal paroxysms are subject to wide variations over a period of months or years, in the same individual. Often discomfort increases, but occasionally the attacks become less numerous and milder, occurring only after unusual exertion or an intense emotional experience. They may even disappear completely. The patient learns to adapt himself to his malady; his nervous system becomes more stable; and perhaps compensatory adjustments take place in the coronary circulation. Under such variable conditions, and when judgment of the therapeutic result must be based entirely upon the individual's account of his subjective experience, a just appraisal of the value of any particular medicament is difficult. A recent study was made in the Cardiac Department of the London Hospital, designed to throw light on this very point[2]. After giving some fifteen different preparations to ninety ambulatory patients, with a placebo regularly substituted for an active drug, the authors were unable to convince themselves, after two and a half years of observation, that any drug was worthy of trial in routine treatment.

SURGICAL MEASURES

There is a small group of individuals who suffer intensely from anginal pain and who, after trying faithfully all of the measures which have been outlined, including rest in bed, continue to find life burdensome. For this limited number, surgical therapy may be undertaken, with the clear understanding that there is no question of altering the basic pathologic state; the aim of treatment is purely the relief of pain.

In America, cervical sympathectomy for this purpose is no longer common practise. It has been tried and found to be neither rational nor effective. Section of those dorsal roots carrying painful impulses from the heart does indeed abolish discomfort. It is a difficult technical procedure, involving laminectomy and requiring a long session on the operating table. It has been performed successfully in a few cases[3]. But in the presence of severe coronary disease, such an undertaking is not to be undertaken lightly. The one patient in whom I have seen the operation attempted, while under the anesthetic, developed a thrombus in the left coronary artery just as the surgeon was about to make his incision, and died twelve hours later.

The paravertebral injection of alcohol, if skilfully done, is practically devoid of operative risk. In a series of twenty-six cases under my observation at the Presbyterian Hospital, Dr. Richmond L. Moore has carried out this procedure without mishap. After a review of the literature and a survey of the records of our own patients, it appears that complete or great relief of pain may be expected in approximately fifty per cent; some degree of relief will be obtained in another thirty per cent; and in twenty per cent, the injections prove to be entirely without benefit[4]. The operation must, of necessity, be done without the aid of visual guidance. The ability to deposit the alcohol in the vicinity of the small ramicommunicantes is probably the largest factor which determines success or failure; and this will vary with the technical dexterity of the surgeon. If relief was afforded, the effect has lasted for as long as three years, and may be permanent. The most troublesome complication has been painful intercostal neuritis, which has resulted from the infiltration of the intercostal nerves with alcohol. This has persisted for as long as eight weeks. It is apparently, at times, unavoidable, due to the close proximity of the various nervous structures at their point of exit from the spinal canal.

There need be no fear of eliminating pain as a danger signal given out by the heart. Almost invariably, a substitution symptom has appeared—dyspnea, a sense of clutching in the throat or substernal oppression—which has served as a guide to the patient. Such substitution symptoms are promptly relieved by nitroglycerine. The patients generally know from their own experience how much they may safely do.

During the past year our Boston colleagues, who first suggested total thyroidectomy as a therapeutic procedure, have been accumulating information concerning its effects[5]. It is their idea that with a lowered metabolic rate, the cardiac output and the velocity of blood flow are lessened and so a lighter load is placed upon the heart. An impaired coronary circulation, inadequate for the needs of a normal metabolic rate, will carry sufficient oxygen for the myocardium which is functioning at a lower level. The reported results are indeed encouraging. Our own experience is too limited to permit of an expression of opinion. Longer periods of critical observation will serve to assign to thyroidectomy its proper place in treatment.

In conclusion, it is well to stress again the importance of a complete analysis of each case. This should include not only a consideration of the medical problem, but the social, economic and personal aspects as well. It is not within our power to abolish, or indeed significantly to modify, those physical disorders which are responsible for anginal pain. Moderation, tempered with optimism, will bring comfort to many; for some, in spite of limitations, there will be possible a long and fruitful life. For the rest, there must be solace in the words with which Sir William Osler, almost forty years ago, ended his lectures on "Angina Pectoris and Allied States": "Terrible as are some of these incidental conditions accompanying coronary artery lesions, there is a sort of kindly compensation, as in no other local disease do

we so often see the ideal death—death like birth 'a sleep and a forgetting'."

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THE SOCIAL ASPECTS OF DIABETES: A STUDY OF SIXTY CASES*

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PURPOSE OF STUDY

THE diagnosis of any but the very mildest form of diabetes formerly carried with it the knowledge that life would be greatly shortened, efficiency would be reduced, and rigid adherence to a diet inadequate for normal activity would be necessary. With the discovery of insulin in 1922 came the hope, not only for added years of life, but also for happiness and normality in those added years. For these benefits there was a definite price to pay which to most diabetic patients must have seemed small, the regular use of insulin and care in choosing the diet.

Having become accustomed to health and a greater expectancy of life, did this gratitude for relief continue? What did the patients think whose first acquaintance with diabetes meant merely the need for insulin and weighed diets rather than the starvation that sufferers from diabetes had known before insulin came into use? Did the inescapable injections of insulin and constant weighing and selecting of food seem a terrific responsibility, and did the constant attention demanded prevent them from living as they formerly had lived? What of the patients' attitude toward the treatment, and how nearly normal could their lives be made with such limitations? An attempt to secure answers to these questions was the reason for the following study.

METHOD

The selection of cases for this social investigation was based on the following considerations: 1. The patient was to be of an age when active occupation or attendance at school was possible. 2. The diabetes was to be of such gravity as to necessitate the continuous use of insulin together with a regulated diet. 3. Treatment must have started one or more years before the time of the investigation, so as to allow time for the newness of the regimen to have worn off. A personal and comprehensive interview was secured in sixty cases answering these criteria. Twenty-six patients were males, thirty-four females; forty-six lived in urban communities, fourteen on farms. Eight were engaged in professions, nine pursued other "white collar" occupations, two were skilled mechanics, four were laborers, fourteen were housewives, sixteen were students in school or college, and seven were unoccupied.

ADJUSTMENT IN OCCUPATION

Forty-three patients had continued working at their original occupations. Ten patients had found it necessary to make some adjustment in the work they had been doing or to change their occupations entirely. Not one of those gave the advice of his physician or the dissatisfaction of his employer as a reason for his change or modification in occupation. Each change had been made in order to secure less strenuous work, and work in which the patient himself would have fewer responsibilities and would be subjected to little pressure. Only one of the ten patients had continued to work for an employer; the others all had been able to arrange to work for themselves or for members of their immediate families. The length of time patients in this group had had diabetes averaged three and nine-tenths or four years. This indicates, when compared with the duration of the illness of patients who had stopped working, that patients adjust themselves to the requirements of the disease and have a tendency to be less affected occupationally as the duration of the disease increases.

Seven patients were not working. Neither physician nor employer had in any case advised them to give up work. Their attitudes varied, as was shown by the reasons they gave for inactivity, but all of them except one had discontinued work because it was convenient and possible for them to live without working and because they chose so to live. All seven regarded

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themselves as unwell and felt it necessary to make health their first consideration. The two patients in this group who had had diabetes for the longest period had been afflicted for only three years, and had had only fair success in carrying out the treatment. The other five had been under treatment for two years or less, and their success in carrying out the treatment had varied from fair to none. This suggests that they might be expected to return to work at some later time when they have become more accustomed to the disease and its treatment.

ADJUSTMENTS IN RECREATIONAL AND SOCIAL ACTIVITIES

Twenty-one patients said they had not found it necessary to reduce their participation in social and recreational activities; one, in fact, said that he compensated for the dietary limitations by increasing the number of dances and social functions he attended. Twenty-seven patients had reduced the amount of recreational activity; twelve had practically given it up.

Several younger girls had used the reducing diet fad as an excuse for their choice of food.

Twenty-four patients had continued to do much as they always had done in recreational and social activity; when the necessity arose, they estimated the amounts and the food values of the dishes served. This ability seemed to be possessed particularly by those who had had diabetes for a considerable period of years and had become so accustomed to weighing their food that they could estimate with considerable accuracy. Many patients became so adept that they estimated almost entirely and only occasionally weighed their food to detect any tendency they might have to overestimate. With few exceptions these patients watched their urine tests carefully and governed their dosage of insulin by the results.

Seventeen patients had continued with much the same type of activity, but estimated their food and reduced to some extent their participation in social affairs. Several of these patients expended what energy they had in keeping up with their work, and had less energy to put into their recreation. Outstanding as an example of this group was a publisher who worked under high pressure at all times, and who, because of the interest and the responsibility which he felt for his business, could not force himself to do less. As his business increased he had more work to do and less and less time for his former social interests. He realized that by reducing the amount of energy he expended on his work he could correct this without harming his business, but because of the difficulties arising from his diet he preferred to reduce his recreation and do the same amount of work. He found explanations of his diet embarrassing, considered social affairs for the most part detrimental to his health, and finally reduced himself to very few social affairs (and those to meeting with intimate friends as much as possible) and golf, which one could imagine he played with the same terrific drive he used in his work.

Sixteen patients had found it better not to attempt to take meals away from home. This seemed to be the reaction of patients who had had diabetes for shorter periods. Many said they had ceased to eat away from home when they had first learned of the restrictions imposed by their disease, but gradually had adjusted themselves to a program less restraining. Most patients had continued with the same type of activity, but were disappointed to find how many of their recreations centered around food.

Five patients had found it most satisfactory to carry both their food and insulin with them. Four of the five were living in small communities where the fact of their diabetes was generally known, and two of the four were children who were not old enough to take the responsibility for their own diets. The fifth was a woman living in an urban community, but whose social activities were almost entirely with one group. She generally knew her hostess well enough to request substitutions in refreshments which would make them more suitable for herself, but felt no hesitancy about bringing her own lunch if it was a matter of convenience either to her or to her hostess. She also carried her insulin with her at all times in order to be prepared for any emergency.

Five other patients occasionally carried lunches with them in preference to eating in restaurants, and three carried their insulin at all times.

Three patients arranged for special food in order to follow their diets. One was an older woman whose social contacts were chiefly limited to intimate friends from whom she felt she could ask special favors; another was a professional woman who also limited her contacts to intimate friends, and another was a child whose mother made the arrangements before the patient went to the children's parties which she frequently attended.

These patients, therefore, had found ways of continuing their activities without much hardship. The greatest number of changes in previous habits were those that would avoid attracting attention to the matter of diabetes. Patients whose associates comprised only a small group had made things easier for themselves by discussing the limitations with their friends and making suggestions as to the food they could have. Administration of insulin had proved to be no handicap socially, and few patients found it necessary to change their activities because of the necessity for taking it.

However, as mentioned before, twelve patients gave the information that they had discontinued all social and recreational activity. They

had not been advised to do this and there is some question as to the real reason for it being done in each instance. Two gave advancing age as a reason for their inability, and another had been under treatment for cancer. Two utilized what energy they had in their work, one had been a clubwoman who felt she could not continue with club meetings and banquets and still follow her diet, two were having poor success in following the advice given them and as a result suffered from reduced efficiency, and another was a youth of seventeen years who, although claiming that he had given up all of his former recreational and social activities in the form of competitive sports, had in fact developed great enthusiasm for hunting and fishing and occupied most of his time in this way.

Three patients had given up their activities for reasons not concerned with health. They recognized that, had they made the effort, it probably would have been possible for them to have lived very much as they formerly had lived. Two of the three were extremely sensitive and were unwilling to be conspicuous by being different from their associates. In one of these two patients the idea was fostered by his parents who evidently looked on diabetes as evidence of poor protoplasm and were ashamed of it in their child. They had concealed it as much as possible, and had made the patient feel that there was a definite stigma connected with it. The patient had concealed the disease from his friends and had avoided any situation in which his restrictions would be noticeable. The other patient in whose adjustment sensitiveness played a large part had had diabetes for two years. During the early part of his illness he had been poorly treated and had been forced by lack of strength to avoid any strenuous type of activity. By the time he had secured better treatment and regained his strength his associates had gone on to other types of activity and the patient had lost interest in what they were doing. He felt it was easier to get along with solitary activities than to re-enter a group with the handicap of a special diet and insulin. He admitted that the only activities offered by his community were church functions, which did not appeal to him. The third patient of the three had given up all social and recreational activity when the diagnosis of diabetes had been made, and had devoted all of his energy to the carrying out of his regimen. He followed his diet with greatest accuracy, made his urine tests several times a day, and read everything available on the subject of his disease. He treated himself as something of an invalid, although he admitted that his general health was excellent and that he felt he would be capable of very nearly normal activity in all respects. The patient had formerly been a traveling auditor, and in addition to his occupational life his social life had been very crowded. He felt that his former manner of living had contributed to his illness and hoped that by exercising great care he would be able to improve his condition so that he could use a qualitative diet without insulin, and then return to his former job.

Of this group of twelve patients, then, who had discontinued the greater part of their social and recreational life, three felt physically capable of continuing social activity, and gave other factors as reasons for abandoning it. Three others gave physical conditions other than diabetes as the primary cause. Six felt themselves incapable of continuing their social activities because of diabetes, although no physician had advised such a course and with the exception of two who were receiving inadequate treatment, they were all living normal lives in other respects, and probably could have adjusted their recreational lives had they made the effort.

MENTAL ATTITUDES

Thirty-six of the subjects for this study were very conscientious about following their treatment. Nineteen regarded the discipline involved as a serious social handicap. Nine patients were neither conscientious nor careless. All followed their diet, but it did not impress them as being any kind of a handicap. They had all made readjustments socially, but their mental attitude was such that they could forget their disease most of the time. They had learned its requirements, had established the habits necessary, and could carry out their treatment without much thought. As one would expect, most of the patients in this group had had diabetes over a period of years and their easy acceptance of the disease was probably the result of the time they had had to become accustomed to it.

Fifteen patients were careless in carrying out their treatment. They had received a complete course of instruction, but did not adhere continually to what they knew should be done. Five failed to realize the importance of the regimen, and thought that an occasional breaking of their diet would have little effect on their health. Ordinarily they were careful to eat only the food allowed them, but if it was inconvenient, or if they had a strong desire for some forbidden article of food, they did not feel that it was important if they overstepped. As a group their attitude seemed to be that as long as they observed the diet more often than they disregarded it they were safe. Two other patients were children whose mothers were responsible for their failure to receive careful treatment. Both of these mothers had had sufficient instruction in the handling of their children's diabetes, and were in a position to secure any other advice they might have wanted. Their attitude, however, was one of indifference and

they could not be made to realize the importance of careful treatment. One of these children was thirteen years of age, the youngest in a family of five children. The older brothers and sisters sympathized with him and favored him, and the mother openly pitied him because he could not have the food that was served to the rest of the family. She was also guilty of giving him such things as cake and cookies and telling him that a little of it would not hurt him. The other child, also a boy, was the only child of a woman who was extremely hard of hearing, and who had been divorced from her husband. These two factors combined to make her dependent on the patient as an outlet for her affection. A sensible woman in all other respects, she continued to let the boy have candies and sweets because she could not refuse him. She cut down his insulin, occasionally even omitted it, so that she could give him money for the movies. Both of these children developed the attitude that the rules they had been taught were to be learned and followed verbally, but if they could break them without being found out, it was to their advantage. Four more patients realized the importance of following the regimen, but preferred running the risk of being ill to the continual restriction of a diet. They were all young people who felt that the rigid adherence to a diet would necessitate too many changes in their social lives, and as one patient expressed it, they preferred enjoyable lives now to prolonged lives of constant care and attention to diet. They were all careful and even conscientious when they were alone, but they refused to let their restrictions interfere with their social lives. The general attitude of the remaining four careless patients was one of laziness. They all realized the importance of treatment, they did not speak of being restricted socially, but the effort of carefully measuring food was too great for them. They disliked the inconvenience of the diet and of taking insulin, and if it became monotonous or troublesome they felt no compunction about not following it for a time. The fact that none of them had had any serious difficulties probably allowed them to continue with their rather slipshod habits.

The emotional reaction of patients to insulin was not so decided as one might expect. Seven patients disliked it greatly, and the dislike of three of them was strong enough to make it necessary for someone else to give the injections. Nine patients were embarrassed about taking insulin and avoided being observed while taking it. The injection is of a personal nature and the use of any hypodermic suggests to most people the narcotic habit. Only one patient had been accused of this habit, and although he expressed amusement, he admitted that he had been careful not to give opportunity for anyone to accuse him again. In all probability all other patients in the group of sixty felt some hesitancy about being seen taking insulin but either made no attempt to conceal it, or did not feel that it was important enough to mention.

Four patients lived in fear of having some situation, such as delay in getting home, prevent them getting their insulin. They were constantly afraid they would unknowingly eat something with ingredients forbidden to them. This group had nothing else in common either occupationally, socially or physically. Three were somewhat unstable emotionally. The fourth was a girl still in high school who had been made to fear the consequences of breaking her diet when she first had the disease, and still was fearful. She had had diabetes for two years. Her oversolicitous mother supervised everything connected with her condition, and continually reminded the patient of the results of overstepping her diet when away from home.

Most of the sixty patients regarded their diet as a necessity and did not criticize it. With some this noncritical attitude was premeditated; with others it was a normal reaction to being told of the dietary requirements. Six patients disliked the diet because it made them different from their associates and occasionally conspicuous in a group; five felt that it was inadequate for their energy requirement and were continually hungry; only two disliked the diet enough to make it hard for them to follow it. Both of these were Jewish. Earlier established food-habits may have played a part in the dislike of one of them for the diet. The other had never observed Jewish law, but it is conceivable that she may have developed a preference for the food cooked by her Jewish friends who did observe the law.

An attempt was made to classify mental attitudes according to the following category. The items named were encountered singly or grouped in individual patients.

Considered no handicap: The patient felt that diabetes did not place him at any disadvantage.

Philosophical: The patient accepted his disease without rebellion or protest.

Open: The patient discussed his disease without embarrassment and made no attempt to conceal from his associates his need of a diet and of insulin.

Hopeful of cure: The patient hoped that by careful attention to his treatment he would in time improve his condition so much that insulin could be omitted, and attention to diet could be relaxed.

Considered a handicap: The patient considered the disease and the changes made necessary by it a social or occupational disadvantage.

Conceals: The patient attempted to prevent the fact that he had diabetes from coming to the observation of others.

Sensitive: The patient felt that his having diabetes lowered him in the public estimation. The patient himself may not have been conscious of any handicap, but because of lack of understanding on the part of the public, he preferred to discuss his condition as little as possible. When it was necessary to discuss it he felt some embarrassment, and was again made conscious that he was restricted as other people were not.

Depressed: The patient had become despondent and discouraged over his illness. In most cases this attitude affected his entire life.

In summary: Forty-five patients manifested predominantly healthy mental attitudes and fifteen predominantly unhealthy mental attitudes.

Some peculiar combinations of reactions were encountered: The most unexpected, namely, "conceals, no handicap, and philosophical" occurred in two cases that were interesting from the standpoint of adjustment. The first was a youth of twenty years, who had had diabetes for eight and a half years. During this time he had completed high school and one year of college. His school program had been very heavy, and in addition to this he had always worked to pay part of his expenses. He was extremely interested in the Reserve Officers' Training Corps and had been a member of it for two years at the time of the interview. On completion of his college work he hoped to secure an appointment in the army as an engineer. So far he had not revealed the fact that he had diabetes, because of fear that it might disqualify him for an appointment. Very few of his associates knew of it, and by using insulin and regulating his diet before required physical examinations he had managed to conceal it from the school physicians. He felt himself capable of doing a full job of any kind and did not feel that his diabetes handicapped him in any way. In his acceptance of the disease he was philosophical, recognizing its presence, but with the exception of a few adjustments, disregarding it to a large extent. The second of these patients was a young married woman who taught school in addition to keeping house. Her chief reason for concealing her disease was to avoid the sympathy of her friends, which she had earlier found to be very distasteful. She felt that her disease was no handicap occupationally, and the reduction of social activities which concealment made necessary was to her liking.

ECONOMIC CONSIDERATIONS

The following information is not based on accurate accounts, but only on estimates as submitted by patients. Patients who had had diabetes for a year or more had become so accustomed to the changed diet that they regarded it as a necessity, the cost of which was not to be considered. For the most part, patients felt that the additional fruits, vegetables, cream and butter were expensive, but that the additional cost of these was balanced by the reduction of carbohydrates in the form of desserts and between-meal lunches. Only two patients used diabetic foods and confections regularly; one estimated that he spent one dollar extra each week, and the second felt that fifty cents a week covered the cost of these preparations and the out-of-season fruits and vegetables she used. Others occasionally used diabetic candies and gums or desserts, but felt that the added expense was no greater than the extras other members of their families indulged in on special holidays and celebrations. Two patients felt that the cost of their diets varied seasonally, being more expensive in the winter than in the summer. Both of these patients lived in rural communities where it was sometimes difficult to secure fresh foods in the winter, but where, in summer, the products of their gardens made it possible for them to reduce the cost of their diet considerably. They felt that in the long run their diet was no additional expense.

Those patients who lived away from home found their problems more serious. Boarding houses where it was possible for them to secure a diabetic diet were scarce and in only one instance was a suitable one found. Here the patient was allowed to go into the kitchen and measure her food, as well as to make what substitutions she saw fit without extra charge. This arrangement was made after the patient had found it too expensive to eat in the dining room of a nearby hospital where she was charged one dollar and eighty-five cents a day for meals. Three young women found it most satisfactory each to have her own apartment, and they found that they could live this way without extra expense.

The experience of three men who were living away from home was less encouraging. One, who formerly had eaten in restaurants, found that he was spending a minimum of three dollars extra a week. His salary was not large enough to allow of this, and at the time of the interview he was making arrangements for his mother to live with him and to prepare his food. This had the added advantage of relieving him of the sight of food which he knew he should not have but found it difficult to resist taking. The second man in this group found he could not continue with his work, which necessitated constant traveling, because of the expense of the diet. He has been mentioned in the foregoing, as the patient who hoped to improve his condition by rigid adherence to his regimen, and although this was a large factor in his giv-

ing up his work, the expense also played a large part. He estimated that eating in hotels and dining cars was impossible for the diabetic patient without doubling the amount spent on food. He found table d'hôte meals planned almost entirely around forbidden foods, and meals ordered à la carte became expensive. The third man of the three was the patient of the group who had had diabetes for the longest time, and although he lived in a hotel, and took all of his meals there, he denied that the expense of his food had increased.

The cost of insulin and other materials, including syringes, needles, alcohol and Benedict's solution for this group of patients averaged about one dollar and seventy-five cents a week. Many patients found this additional expense difficult to meet, but only four of the sixty were forced to ask for help in meeting it. None of these four had had help from relief agencies for any other reason. Two more patients had been able to make arrangements with their drug-stores to secure insulin at cost. Had this not been possible one would have been obliged to seek help, although the other would still have been able to secure insulin himself.

Although, as previously has been mentioned, several patients had changed their occupations, only one of those who continued to work, a secretary, felt that her earning power had been reduced. Because of her illness she had found it necessary to take a position which, although it was a full-time occupation, was easier, required shorter hours, and commanded a considerably reduced salary.

CONCLUSIONS

Although conclusions drawn from study of a group no larger than this are of little value statistically, it is believed that the study indicates what may be expected from careful treatment of diabetes. Physicians with experience in this field have felt that diabetic patients should be able to live normal lives, and that most of their patients did so. This is confirmed. The majority of the patients investigated have found it possible to carry on their former programs of work and recreation. Three of every four of them have been able to adjust their lives and have felt no handicap because of their imposed regimens. Three of every four have made satisfactory emotional adjustments to the changes necessary, and four of every five have emotional attitudes that are positive and healthy. Many of the failures in adjustment were caused by factors other than diabetes.

Since the discovery of insulin, the majority of patients with severe diabetes have become useful and happy people, taking their places with their associates, and asking neither sympathy nor special consideration. As a group they are proving that diabetes as a chronic disorder need be no handicap, and that personality and character are the factors determining the effectiveness of treatment.

CARCINOMA OF THE CERVIX UTERI WITH EIGHT MONTHS' PREGNANCY

BY JAMES RAGLAN MILLER, M.D.*

THIS case report is presented for two reasons, first, because it is a duty to record in some detail every such case in order that clinical experience may be developed in the literature which is impossible for any one physician to acquire, and secondly, to report a procedure in operative technique which I consider important and which I have not been able to find mentioned hitherto.

The patient, aged 27 years, was admitted November 3, 1933 as a ward patient to the Day Kimball Hospital, Putnam, Connecticut. (I am indebted to Dr. Karl Phillips of Putnam for permission to report this case and for the opportunity of operating.) She had had four children in eight years of married life, and was about thirty-four weeks' pregnant, her last period being in March. All previous pregnancies were normal and went to term, the last child being delivered normally four years previously; one abortion occurred two years previously. There is no family history of cancer.

Present illness. During the fifth month of pregnancy she began to bleed vaginally, especially in the morning. She consulted a physician who gave her medicine but did not examine her. After remaining most of the month in bed, the bleeding disappeared and did not recur until the day before admission. For one month there had been pain and soreness in the pelvis and rectum described as "pressing" or "pushing". For two weeks this pain had begun to radiate to the left hip and leg. Considerable vaginal bleeding brought her to the hospital. The general physical examination was unimportant except that she looked poorly nourished and anemic and had a mild psoriasis and many decayed teeth. The pulse was not rapid, temperature and respirations were normal, blood pressure, 108/78. The uterus was enlarged corresponding to a full seven months' pregnancy, with a placental souffle over the lower abdomen, which was noticeably tender on palpation.

Vaginal examination revealed blood clots and a hard irregular gristly tumor involving most of the cervix, especially on the left side.

X-ray examination showed a fetus in L.O.A. position.

R.B.C., 3,600,000 Hgb. (Dare) 56 per cent. Urine; no albumen or sugar.

On November 8, under gas-oxygen, a cervical biopsy was taken which showed squamous cell carcinoma of the cervix.

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Iron ammonium citrate was given in large amounts and a transfusion of 500 cc. of citrated blood was given on November 21. Two days prior to the transfusion her blood count showed R.B.C., 3,430,000 Hgb. 48 per cent. On the night before operation some beginning labor pains were quieted by 1/8 gr. morphine sulphate.

FIGURE 1. Uterus with cervix, showing sutured cesarean wound. A rubber tube lying in the right ureteral groove under the uterine cavity shows the extent of the dissection necessary.

FIGURE 2. Shows the uterus and cervix opened. The placental site is on the cut anterior surface of the uterine cavity. The fetal membranes covering the internal os had been lifted up to take a culture (hemolytic streptococcus and staphylococcus aureus). An ample cuff of vagina is shown. (See pathological description.)

Operation. November 24, 1933. Classical cesarean section followed by immediate Wertheim hysterectomy under spinal anesthesia, pantocain, 20 mg.

Before giving the anesthetic the vagina was cleansed as carefully as possible, dried and filled with 4 per cent mercurochrome gauze. It was evident that the cervix was infected not only by necrosis of the carcinoma but also because of the biopsy wound, so I planned to remove the fetus by fundal incision and leave the placenta in the uterus during hysterectomy. This procedure was suggested, I find, by B. Solomons, but as in my case, he found it impossible to carry out this plan, for the placenta was implanted on the anterior wall and had to be removed. In this case, however, I was able to remove the placenta, cutting the membranes free and leaving them in situ. As will be seen, this plan was successful, for on opening the sutured fundus later in the laboratory, the internal os was found entirely covered by membranes.

That this item of technique seems worthy of consideration is shown by the finding of hemolytic streptococcus and staphylococcus aureus on culture taken under the membranes at the internal os. I feel that the danger of peritonitis caused by virulent bacteria is very great in these cases and that such a precaution as this is worth while.

Concerning the rest of the operation there is little more to say. The size of the cervix made any radical parametrial dissection not only inadvisable but well-nigh impossible. Once the uterosacral ligaments were cut as far back as clamps could be placed, the uterus became mobilized. Dissection of three to four inches of ureter was necessary and not unusually difficult and the vaginal clamps could be placed with ease.

The patient stood the operation very well and healed without infection. During the second week she suffered a considerable cystitis and pyelitis attack as is not unusual, and she has made a slow convalescence. She is to receive deep x-ray therapy as soon as she can be transported to Hartford.

The baby weighed five pounds and five ounces (2400 Gm.) at birth and has gained normally on artificial feeding.

Pathological Report by Dr. R. E. Kendall, Assistant Pathologist, Hartford Hospital:

No. 25076. Entire uterus with both tubes and ovaries attached, the uterus measuring 22 x 14 x 8 cm. The cervix is enormously enlarged measuring 7 x 7 cm. The myometrium measures 2 cm. in thickness. Covering the posterior wall and the internal os there is an intact fetal membrane. Just above the internal os on the right side a well-defined fossa can be seen corresponding to the position of the ovary, and forming one margin of this is a portion of the uterine artery. On opening the cervix there is a fungating mass extending from the left side primarily as a large ulcerating polyp. The mass completely surrounds the os and on section on the left side it is 2.5 cm. in thickness. It approaches close to the line of incision but at no point has the incision grossly involved the tumor tissue. On the left side just above the internal os posteriorly there is a large lymph node 1.5 cm. in diameter that does not appear to be involved. The carcinoma extends as far as the internal os longitudinally, measuring 6.5 cm. There is a wide cuff of vaginal wall which at its narrowest point measures 2 cm. The tubes are normal in appearance. The ovaries are 5 and 5.5 cm. in their greatest diameters. Over the surface of the left ovary are two small hemorrhagic vesicles 3 mm. in diameter and many tiny amber vesicles 1 to 2 mm. in diameter. Similar small vesicles are seen on the right ovary in which

there is a well-developed corpus luteum of pregnancy 1.5 cm. in diameter.

Culture taken from the internal os under the membranes showed streptococcus hemolyticus 1 plus, and staphylococcus aureus 2 plus.

Microscopic sections of the tumors involving the cervical canal showed an epidermoid carcinoma which is quite cellular and arranged in irregular small compact alveoli. Cells are largely fusiform in shape, moderately anaplastic with a moderate number of mitotic figures present.

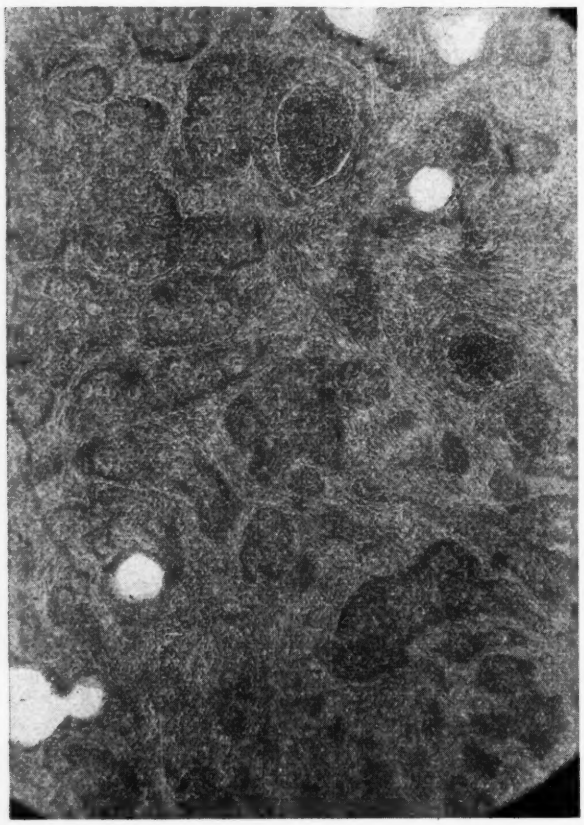

FIGURE 3. Microphotograph shows the invasive alveolar arrangement and type of cell. Two alveoli are shown with their central core made up of polymorphonuclear leucocytes showing the infected nature of the tissues.

Carcinoma of the cervix complicating pregnancy is so rare that I, for example, have waited twenty years to see my second case. This rarity makes it difficult to evaluate details of extraordinary scientific interest which these cases show. In almost every type of carcinoma and sarcoma, pregnancy exerts such a deleterious influence on rapidity of growth and metastases that it can be considered almost malpractice from a scientific point of view not to interrupt pregnancy as soon as the diagnosis is made. Many reasons for this rapidity of growth have been suggested, including the hormones of the anterior pituitary gland, the increased cholesterin content of the blood, and so forth.

Strange to say, carcinoma of the uterus seems to some observers to be an exception to the rule that pregnancy speeds up cancer growth. Such men as G. A. Wagner, Weibel, A. Meyer, Schweizer and others even believe that they have observed a contrary or retarding action of pregnancy on carcinoma of the cervix; there is also some experimental work on animals which lends support to this view.

From a practical point of view it is interesting to note that all twenty-six of the cases of pregnancy in Weibel's series of fifteen hundred cervix carcinomas were operable, the operative mortality was 4.17 per cent and the five-year arrests were more than the average for the whole series. Two of the three extensive cases were "cured". In Franz's series of eleven cases, three died of the operation and five were "cured".

In the United States, particularly, a whole generation of gynecologists is now growing up which has no experience with radical pelvic surgery in cancer, nor an appreciation of the technical skill or of the dangers of this type of work. This change of practice probably is a good thing for the usual patient with cancer of the cervix, but in such cases as this there is no substitute for surgery. Though rare, they may present themselves at any time and the technique of the Wertheim operation must be available.

To summarize:

(1) A case of carcinoma of the cervix at the eighth month is presented, treated by cesarean section and immediate modified Wertheim hysterectomy with good primary results for mother and baby.

(2) It is urged to leave the membranes in the uterus to cover the internal os which is usually infected and so to avoid soiling the abdomen.

(3) A plea is made for detailed report of similar cases, that we may better know their prognosis.

(4) The technique of the Wertheim operation is becoming a lost art in this country, much to the detriment of such emergencies as this case presents.

THE CASE FOR GROUP PRACTICE

BY HARRY C. SALTZSTEIN, M.D.*

THE publication almost two years ago of the Report of the Committee on the Costs of Medical Care was the signal for much public and private debate about the economics of the practice of medicine.

As everyone knows, all the participants in this study agreed that adequate scientific medical service and facilities should be accessible to all the people, no matter what their incomes are; and that those who furnish the services should be properly remunerated. There was also agreement about the need for preventive medicine, and improvement in public health services, in teaching and in better regulation of the practice of the specialties.

From here, the Committee, after its exhaustive labors, split sharply and filed separate reports. Omitting non-controversial items, the majority recommended that medical service, both preventive and therapeutic, should be furnished largely by organized groups of physicians, dentists and nurses, pharmacists, and others, preferably centered around a hospital, the services to include home, office and hospital care, with the maintenance of high standards, and the development and preservation of the personal relation between physician and patient; also that the costs of medical care be placed on a group payment basis, through the use of insurance, of taxation, or both, though service on an individual fee basis for those who prefer it, need not be precluded.

The minority, which included about half of the practicing physicians on the Committee, violently opposed any suggestion of grouping, fearing socialization; and insisted that the individual practitioner, who could adequately treat 80 per cent of all patients, should be restored to his central place in medical practice.

Thus the two controversial sections in the Report were the recommendations for health insurance and grouping for the practice of medicine.

The majority were accused of being impractical experts, of trying to prove previously held theories by means of gathering statistics. The American Medical Association and many county societies officially urged physicians to support the minority viewpoint (which was also criticized as being destructive and offering no solutions) as representing the best interests of both physicians and patients.

This discussion is concerned only with the arguments for or against group practice. Though the road is still rocky, health insurance does not seem to have caused the violent dissension which grouping versus individual medical service has, and several plans for establishing health insurance are in the making or in operation with the approval (either active or tacit) of the medical profession. (*J. A. M. A.* 102:698 [March 3] 1934.)

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GROUPING

The chorus of opinion against Grouping was much more vociferous than were the advocates of any such change. Many felt that Medicine would thus be commercialized, using the methods of big business with its boosting, financial programs, credit, sales appeal, etc. and the corresponding toboggan in a depression. Medicine does not have to adapt itself to the social trends about it, and may be a "greater social force by remaining aloof and distinct", said others. Such words and phrases as "lay control of the practice of medicine", "restriction of freedom of physicians", "sovietizing medicine", "contract system", "Governmental control of medicine", and ensuing political rackets were bandied about loosely without much analytical thinking of conditions and problems the Committee sought to solve.

Lapse of time has somewhat quieted the storm. Though medical societies in different places and in different ways are studying these problems and attempting solutions, the vast majority of doctors are much more interested in their own routine care of the individual sick patient than in any mass measures of economic thinking which are foreign to their daily tasks.

THE DOCTOR'S VIEWPOINT

Except for financial aid, or the possibility of governmental supervision, the problem of practicing in groups involves the doctor first and last; hence one of the problems is how his mind, his viewpoint, the breadth or limitations of his vision react to group endeavors. What are the characteristics of public opinion of the medical profession as a class group when expressed about a matter which vitally concerns them?

The doctor, primarily, is interested in problems involving one patient, one course of treatment, one family at one time. Unless his activities involve executive responsibilities, numbers of patients mean little to him. Mass figures of total sums spent for illness, inadequacies in the care of the entire population are not grasped by him as a business executive would grasp them. They are beyond his professional horizon.

Next, he is conservative-minded. Though medicine progresses by leaps and bounds, doctors, as a class, hesitate to try new procedures on their patients until these procedures have been thoroughly tested.

Thirdly, the doctor's success depends in a good measure upon his colleagues' opinion of him. Closely allied to this and more important practically is the fact that the greater the specialist and the more confined the specialty, the greater is his dependence upon the good will of other doctors—else patients will not be referred. Hence, he hesitates, or accepts with caution any suggestion of professional ostracism which grouping away from intimate daily contact with his fellows might bring, and subconsciously looks at such schemes through the mirror of "what will my medical friends, upon whose good will I depend, think of me?"

As a group, doctors are individualists. Our education is obtained from men who command unlimited respect for their opinions. Our daily work is a series of directions, commands, orders, which everyone is taught to obey—nurses, hospital attendants, as well as patients. Small wonder that as a group we have not yet been sympathetic to the group planning, coöperative endeavors, self and governmentally imposed limitations upon the conduct of our businesses which have characterized so many fields of human endeavor since March, 1933. There is a strong wish, even prejudice against it.

The average doctor has had no business training and, generally speaking, is little concerned later in life with financial matters. Consequently, the economist's viewpoint and careful studies of the entire field of medical practice do not fit into his usual vision of the individual patient in whose intimate daily care he is absorbed.

Presidents of state or county medical societies are usually elected for one year. It is generally a mark of popularity, or the reward of affection or esteem for an older member who is either a prominent specialist or general practitioner. Usually he has little direct knowledge or interest in medical economics. When speaking publicly, he must represent the body whose head he is and most of that body is composed of individual practitioners. Sometimes this amounts to voicing the medical guild's group prejudices against change.

Perhaps reasons such as these, illustrative of the doctor's viewpoint, explain the expressed antagonism to grouping (and also to health insurance) which has been so much in evidence since the Committee report.

The practice of medicine demands more idealism, kindliness and human sympathy than almost any other branch of endeavor. It can only be pursued successfully with a large measure of all three. Yet in these discussions of medical-economic policy, physicians, as a group, frequently gain a public reputation for selfishness, lack of understanding, non-recognition of facts, or unconcern with the public welfare. However, as Dr. Barker remarks, "There is no doubt in my mind that my colleagues in the medical profession want the forms of practice and the methods of payment that will be the most conducive to the welfare of the American people; and whatever is really best for the American people, will, in the long run, be best also for the physicians and surgeons who serve them."

With time, and some more "rubbing of noses in the facts" as Secretary Wallace described his approach to the problems of hog marketing, the medical profession can be relied upon to help solve this adjustment as they did that of better medical education, tuberculosis control and others. There will be throwbacks, unwise policies, ultraconservative utterances or cynical opinions. Some of the profession's most brilliant leaders may be some of the most pronounced individualists, and hence will subscribe to these proposals reluctantly if at all. But, if a canvass of the private opinions of doctors could be obtained, not for publication, but simply their personal convictions, I think many would now state categorically that grouping for the practice of medicine, managed with safeguards against exploitation both within and without the profession, would render the patient better medical service, and make for better doctors.

From several dozen personal inquiries, the opinions summarize about as follows: most of the younger men would much prefer to work surrounded by the facilities, advice, and spirit for learning that they knew in hospital or student days. The older men frequently say they prefer their individual practices, which have been their way of life for so long; but add either that "the new order cometh," or that the patient gets much better treatment in the group clinic.

ARGUMENTS AGAINST GROUP PRACTICE

First, to take up some of the objections.

A) Impersonal Relation between Patient and Physician.

The majority report was quite specific in defining the practice of medicine as still a personal service (pg. 39 ff.). "The preservation of a personal relation between patient and physician is an essential element in safeguarding the quality of medical practice." . . . "Medical care, by its very nature, is and must remain a distinctly personal service." "There is nothing mysterious in the relation between physician and patient. On the therapeutic side, it is capable of objective analysis. As to the not strictly medical phases, it is of a piece with all satisfactory human relations involving as they do mutual patience, sympathy, understanding and confidence."

However, a storm of discussion has arisen on this point. Many have said that this relation is not capable of objective analysis. Others, that it is so intimate a personal rapport as to be semi-priest-like in character, that it is our sub-

tle heritage of centuries, and is the one thing which sets the medical profession apart from all others. Grouping, they said, by destroying this relationship, would destroy our most prized professional possession.

In the Middle Ages, priests were the only members of the community who had any education; doctor and priest were often one and the same person. Undiscriminating obedience to authority was the only mode of thought for 98 per cent of the populace; many minor offences were punished by death.

Likewise the days of the old family practitioner only a generation or two ago, were the times when the family sometimes huddled into a corner in his august presence and dared not question his intimate understanding of the disease he was treating at the time. Furthermore, a doctor could much more easily encompass all the known medical lore. Modern specialism had not yet come.

What the critics do not appreciate, perhaps, is that among the changes in our social life which the past hundred years have produced, not the least is the rise of popular education and the augmented sense of personal liberty. With it, the blind obedience to the doctor which in the Middle Ages partook of a priestlike reverence, has gone. Few families now have one doctor. One frequently hears expressions of opinion indicating that, personally, they much prefer accurate knowledge of their diseased kidneys or stomach to the kindliest and most sympathetic manner. Some have told me that they often want a doctor who does not know them at all, feeling that his judgment may thereby be more unbiased. Many discerning individuals, though acknowledging the doctor as a man saddled with responsibilities and tasks which require skill, learning and broad vision, also feel that his mental horizon may not be greater than that of those about him. Incidentally in this modern age, the clergyman is having no end of trouble being accepted at any face value other than that to which his individual knowledge, judgment, and breadth of understanding of social forces entitle him.

Changes in our social life must make us consider whether these ethical values will remain in status quo. Might we not, with profit, modify the concept, aiming to preserve that which is good and adjust the rest to changing times?

B) Introduction of Business Methods.

The same section of the majority report further stated: . . . "The business relation between physician and patient is not considered a necessary part of the personal relation." The possible introduction of business methods into the practice of medicine has worried many critics. Some said that grouping would tend toward mass production, and make laborers out of doctors. "The capital of the medical profession consists in books, accumulated knowledge, and skill," said others, "and cannot be compared to the buildings and machinery of industrial capital from which income must be derived and which determine the economic laws of business." Still others said that professions owe more to philosophy and the renaissance of learning than to the machine age. "Whenever an attempt has been made to transplant the ethics, theories or forms of organization of business into fields of art, science, law, education or medicine, the result has been harmful to professional standards and progress." (An Introduction to Medical Economics Prepared by the American Medical Assn. Chicago, 1933.) A further argument is that groups might compete with one another and cut rates, the cheapest group lowering standards and forcing the better group down with it.

Some of these arguments are not germane to the subject. To admit that medical practice is subject to no economic laws or financial readjustments implies that no betterment is possible, and that we are satisfied. Lawyers do group successfully for business purposes. The private practice of education failed, and was taken over by the state. Some of the same arguments which were used more than a half century ago before that change took place are used to-day against change in the practice of medicine. If business is learning ethics from us, might we not adopt some of their better organizations, distribution and financial methods, which have also been in process of evolution for some time?

C) Socialization.

"Sovietizing", "socializing", "danger of becoming a political racket," are expressions which do not conjure up the mass fear of exploitation and being ground to the dust that they did only a short time ago.

How much socialization of all our institutions we are in for, is, of course, problematical. Whatever else the New Deal may bring us, it is evident to all that much of its underlying philosophy is that the rugged individualism which pioneered the development of a large primeval country of unlimited wealth must now be replaced by the planned economy—a series of coördinated moves having as their object the control and supervision of many of our activities by a greatly expanded executive branch of the government? Dr. Michael Davis expressed the thought to me in this fashion: "In my view, individualism in the forms in which it manifested itself in pioneer days is bound to be limited and, for the most part, can no longer be defended. The problem of this country is to maintain individuality (not individualism) amidst increasingly coöperative forms of activity and increasing recognition of the economic

and spiritual interdependence of people and nations."

This viewpoint is rapidly being accepted in many different spheres of endeavor. It is being accepted uncritically; but a very few years ago there would have been many more disciples of "rugged individualism" in the management of their own affairs than would be counted in a straw vote to-day. Doctors are no exception.

D) Lack of Opportunity in Groups.

There remains the question of equal opportunity in a group versus individually and alone. Some state that the doctor's independence is one of the chief incentives which attract young men into medicine, and grouping, by destroying this, would thin and cheapen the ranks of the oncoming younger physicians. This harks back again to individualism versus coördinated enterprises. The profit motive is not the only mainspring of human effort. Many doctors would thoroughly enjoy being placed on a modest salary with stability assured, so that they could feel free to devote their entire energies to the absorbing problems with which clinical medicine abounds. True, some would prefer individual practice and would be better alone. But, by and large, the commercially minded doctor is far in the minority, and as I tried to show above, the rugged individualist is to a certain extent a product of environment. If professional interests are stimulated in the groups, the change to grouping would, I feel sure, surprise those who hold individual practice to be the sole spur to progress.

ADVANTAGES OF GROUP PRACTICE

What are the advantages of group practice?

A) First, reduced expenses. The majority report stated that, with proper medical leadership, medical facilities could be so efficiently organized that substantial economies in the dispensation of all kinds of medical care would be obtained without sacrifice of (and in fact with actual improvement in) the quality of service, and the income of the medical practitioner would be increased and stabilized. In 1929, one-third of all practicing physicians, one-half of all general practitioners, earned $2500 per year or less. Among physicians of all grades of income, 40 per cent was spent on overhead, office, and automobile. It has been estimated that grouping can reduce overhead one-third to one-half.

The man in the street wants medical service at lower cost. Before the depression there were several studies and many expressions of opinions on this point.

Doctors, as a whole, have never been impressed with these stories or studies. Many doctors spend a great part of their lives working gratuitously in free medical institutions. The medical practitioner loses 20-40 per cent of his income in unpaid accounts, and does not earn very much compared with his friends and neighbors in other lines of endeavor which require far less ability and training. He tends to forget that sickness bills are the only element in the family budget that cannot be planned in advance, or that there are countless sick people who go without medical care. In other words, the doctor is too close to the actual work of medical practice to envision our present-day medical social maladjustments, much less plan for their correction.

What are the prospects for the future? Some maintain that as the depression is cured, the doctors' financial ills will also be cured. A Cleveland newspaper editorial, after likening the resolutions adopted at the recent Cleveland meeting of the American Medical Association to an old-time old guard convention, said, "They (the doctors) hope that the free play of economic forces will again make everybody prosperous—prosperous enough to pay their doctor's bills, anyhow—and permanently prosperous next time."

Without going into detailed analysis, it is evident that the day of large medical fees is waning, what with the trend toward fewer large incomes and the strenuous efforts of the government to increase the incomes of the mass of the people.

We must look to our earnings from a large number of people with modest incomes. A correspondingly smaller number will be able to pay the higher fees from which doctors expected a great share of their income in the past. Here is where the unmet, the "effective" demand for medical service, and health insurance become important.

B) Increased Volume of Professional Service.

The unmet demand for medical care—treatment people should have but do not get—has been estimated as three to five times the volume of present-day practice*. The "effective demand"—the demand accompanied by purchasing power—must be a considerable proportion of this unmet demand, provided the price is right, for "people spend their money for what they most desire at the time." Once give people a chance to get medical services within their means and they will secure a great deal more than the mass of the population has been accustomed to get. With grouping and its resultant low overhead and increased efficiency, medical charges could be scaled according to

*Some of this unmet demand consists of periodic examinations, preventive medicine, etc. The remainder is ordinary diseases which under present circumstances simply are not treated. Recently, in Memphis, to procure goitre cases for a clinical conference, the medical society announced that treatment would be free. The flood of applicants made them withdraw the announcement shortly, but the doctors concerned wondered whether other non-goitre belts similarly have so many untreated cases (Am. J. Surg. 24:256 [May] 1934).

costs. The advantage to the patient who needs medical care but cannot afford to pay much for it ought to be apparent.

The principle of health insurance (with which, as stated at the outset, we are not specifically concerned in this discussion) also enters here. As several careful studies have shown, it is not always the immediate burden of expense, but the uncertainty and unpredictability in the family budget which is the problem. Experience has shown that when the person of small means can plan for and pay regularly against sickness costs, his paying power is increased. Under health insurance, these persons actually spend more for medical services than they do under our present scheme of buying the service as needed, then paying when possible or convenient.

C) Improved Quality of Professional Service.

The statement is frequently made that 80 per cent of all illnesses can be treated by any one physician. It was one of the most frequent arguments against the majority report. "Nothing has been advanced disproving this," said one commentator.

What is the relative efficiency of the treatment of diabetes, chronic rheumatism, heart disease, tuberculosis, allergy, abdominal complaints, metabolism, etc., by individual physicians who treat all these diseases and by groups of physicians each of whom devotes more or less of his special interest to these particular diseases? The question does not lend itself to any analysis which can give a quantitative answer. Questionnaires of doctors' opinions do not provide a proper statistical analysis. The only way a proper answer could be obtained would be from a study of one hundred diabetics, five hundred abdominal cases, of parallel severity and racial type, analyzed before treatment and at a certain interval after treatment. This, so far as known, has never been done. The data would be obtainable from many group clinics, but deficiencies in private offices, in record keeping, follow-up, concentration of cases, etc., would make the study, except in a few instances, hopeless.

Within the past decade, the chapters on stomach and gall bladder diseases, metabolism, peripheral vascular diseases, obesity and many others have been rewritten, practically speaking. A small national committee on rheumatic diseases is exhorting physicians generally to pay more attention to the plight of the chronic rheumatic, for results that are obtained in certain institutions or under certain auspices are not very widely available. Allergy is a rapidly developing specialty, of multitudinous possibilities and one which can be practiced much more efficiently by a doctor dealing with large numbers of these patients.

> I have before me a copy of a national radio broadcast about cancer of the stomach. The "type of patient with cancer of the stomach which consultants see to-day" is described, and the national radio audience is told how the patient, after suffering for a year went to the corner drug store, then to his family physician "who hated to put his friend to a lot of expense," then to another physician who had an x-ray examination, all to no avail. "He was at last taken to a physician who specialized in diseases of the stomach," where the diagnosis was finally made. The case was then hopeless.
>
> This does not mean that the first physician or roentgenologist could not make the diagnosis. It simply means that as consultants or clinics see these cases, most of them have gone through the above wanderings. The eminent physician who delivered the radio talk would not have depicted this as a normal course of events to millions of lay listeners unless he had a background of having seen most of his patients in a hopeless stage after such a history. And that is true. Repeatedly, statistics have shown that most cancers of the stomach to-day are diagnosed after having had several months' medical treatment for supposedly less serious ailments.
>
> In similar vein, a surgeon in Philadelphia recently wrote, after discussing operations and previous medical observation of several cases of cancer of the large bowel: "To-day, the surgical handling of this disease is far in advance of our sociological handling of it." Note that he said sociological rather than medical.

It appears to me that the number of diseased conditions, of which the above examples are just types, represents a large proportion of the total sickness included under the 80 per cent of all illness which opponents of grouping say can be adequately treated by the average physician. The crux is not whether they can or cannot be so treated; but how well they are treated by single individuals compared with their treatment in groups.

"Well, that knowledge is easily available, and with better postgraduate education and the seepage of a very few years, all doctors will possess it. There are no secrets in medicine," one might say. This is true in a sense. It was said that if the Committee on Costs had spent their million dollars on postgraduate medical education, more would have been accomplished. The answer is: the literature is vast, the art is long, the time is short. The spread is great between the available information in medicine and what is used in the daily practice and treatment of the run of patients. Every student of the subject knows that*. By the time the bulk of the profession catches up, the special student is again far in advance, often on another tack.

D) The Need for Coördinated Medical Services. As Medicine is Practiced To-day:

*Here is the expression of a general practitioner, president of a county medical society in New England. "One of the most challenging realizations to the general practitioner is the fact that he must attempt to know something of every disease which afflicts the human body and that consequently he can scarcely excel in any one thing." (Moser, O. A: New Eng. J. Med. 210:1121 [May 24] 1934.)

The young practitioner selects a location for his professional endeavors. The neighborhood medical office is generally a modest—sometimes poorly equipped suite above a corner drug-store. Such offices are scattered in profusion throughout the city, with no more sense of economic necessity than has governed the overdevelopment of independent grocery stores, or the conditions which allow three drug-stores on one corner, or the branch banks of our expansive decade, which sometimes approached two or three per corner.

If the doctor has more education, better initial finances, or attempts specialized practice, a downtown office is established: two hours per day occupancy for which downtown rents and overhead are paid. In either event, the doctor's scientific interest, his learning from others (except for an occasional consultation), centers about the hospital—in the larger cities usually about the free services, for which he competes and strives. His private practice rarely permits sufficient grouping of cases, the records and other facilities necessary for scientific study, observation or progress. The numerous exceptions to this (and granting also that some of the most brilliant medical discoveries have come from isolated practitioners) do not negate the force of the general statement.

On the other hand, the crowded specialist's office, to which patients flock, with an oft-repeated sense of security in the numbers who seek the eminent physician's services, has been criticized somewhat as follows:

(a) Long waiting.

(b) Hurried service.

(c) Lack of attention to other fields of medicine, sometimes inimical to the patient's welfare, e.g., surgeon not taking time for careful abdominal history; dermatologist, allergist, not coördinating his special findings with the general bodily complaints or overlooking organic lesions not within his special fields.

(d) Delegation of much of the work to others; including non-medical assistants. Little personal rapport between patient and the central specialist ". . . . the consultant is often at a disadvantage. He may have never seen the patient before, while the family doctor may have studied his patient over a long period of time." (Moser, *New Eng. J. Med.* above.)

The orderly practice of medicine presupposes patients going from general practitioner to specialist and back, with mutual friendly and satisfactory relationships. However, human nature being what it is: (1) the practitioner does not like to refer more patients than possible to another physician for care. Many have told me they would conscientiously like to have more of their patients examined or treated by others, but cannot because they lose the patient's interest or the fee.

(2) There is a tendency for a patient, once sent to another doctor, to consult the second physician for subsequent illnesses. All specialists recognize this, and even if they are quite conscientious, they cannot help at times taking income which they feel should belong to others.

(3) Regulations and declarations against fee splitting, one of the commercial abuses of the present-day relationships between specialists and practitioners, have had no more effect in many instances in remedying the evils than national prohibition laws had in regulating personal drinking. The interests of both parties must be selfishly appealed to. The practitioner must have more of a finger in the pie than our present system usually permits, to make him relinquish the care of many patients without feeling a sense of injustice because nothing is received in return.

Under our present scheme, no thought is given to the balanced needs of the community. To cite only a few instances: Neurologists are few in number, psychiatrists about non-existent as regards their general availability. Surgeons, nose and throat specialists are in some places in profusion beyond the needs of the populace.

Would not coördinated medical services, embracing all varieties of doctors, with thought to community needs, scientific ambitions, personal abilities and attainments of physicians make for an improvement in our own efficiency and professional well-being?

(E) Educational Advantages the Clinic Offers.

One of the greatest advantages in group practice, however, has not been sufficiently stressed in these professional debates, i.e., the educational advantages the clinic offers.

What is a specialist? We like to think of him as one of very superior intellect, of a vast store of knowledge, who has risen to his eminence by dint of originality of thought, painstaking effort, or by having caught the spark of fire from long association with some master. But no one seriously thinks that this description fits all or even many of the very well-qualified and competent specialists who man the key positions in medicine everywhere in this country to-day. Sometimes a doctor becomes a specialist simply by his announcement of the fact. Often he has the divine spark of ambition, originality, or what not, which would have made him succeed no matter what human enterprise he chose.

In most cases, however, the specialist is a man of good average ability who has had some special opportunity to get extra postgraduate work in a particular field. The choice may have been guided by opportunity as much as by his own preferences or leanings. Heretofore, this training was obtained in free hospitals and dispensaries, university instructorships, and to a limited extent as associates of men with large practices.

Although long hospital services have been well recognized as training grounds for specialties, chiefly the surgical specialties, the opportunities for the same extensive and controlled experience in clinics are not yet fully appreciated. Here, instead of the young doctor seeing first a case of rheumatism, then pneumonia, then a crying baby, next a boil or infection as is his daily work in the office, he may study one hundred stomach ulcers in a row, follow the same number of diabetics, collect the entire experience of the clinic in the care of one special disease over a period of years. This process, aided by constant application, can make any average doctor competent in his specialty. It is only necessary to have the proper understanding, have sufficient clinical material, and not to sail uncharted seas but keep abreast of the works of others by personal conferences and by collateral reading.

In smaller communities, most of the specialists have obtained their education in the large centers. They must come home fully equipped and prepared to be recognized immediately, for unless their private practice soon develops, they have no further access to large numbers of cases.

In larger cities, the free clinics and hospital services give this opportunity "to learn while you earn." During the past few years, free dispensaries have had to increase their service and have been overburdened as has no other health agency. The reason is not entirely that more people have not the money to see their family doctor; the growth was rapid before 1929. The popularity of clinics lies in great part in the fact that the expert services available in these institutions cannot be purchased privately except at a cost far beyond the means of a large proportion of the population.

Is it much of a stretch of the imagination to assume that these advantages which, in the last analysis, are advantages of grouping, would be repeated and expanded if more doctors worked in private clinics, provided the same conditions of volume of clinical material, opportunity for study, and medical leadership obtained?

Now bear in mind, that one of the first points on which both the majority and minority members of the Committee agreed was that "adequate scientific medical service and facilities should be accessible to all of the people no matter what their incomes are." We feel that in any definition of adequate medical service, the above considerations are pertinent and allowances must be made for such rapid and unforeseen scientific advances that what is adequate to-day might not be so considered in another ten years or even less.*

*There is nothing herein intended as a defense of overspecialism or the treatment of all diseases by specialists. How much specialism is wise varies in different situations, with opportunities, personnel available, volume of clientele, economic status and other factors. Its wise direction may demand considerable leadership. The point of view is simply that in polyclinics and hospitals "the individual doctor is never an isolated unit, but is in systematic touch with every branch of medicine."

PUBLIC DEMAND FOR GROUP MEDICINE

The "consumer demand", if one might use this expression, for group medical service does not seem to have become articulate. Except for expressions from economists, magazine writers, and a few practical experiments in certain parts of the country, there has been no general public demand for clinics instead of private practitioners.

But, in addition to the many physicians who, as mentioned above, see the advantages of grouping without actively interesting themselves in any such projects there is one group whose numbers are informed. Social workers are in a position to see the problem. They no longer deal only with paupers. Many of their clients visit a free dispensary for one illness, and their family doctor if they can afford it for another, and the social workers receive countless daily reports about the health of their clients from both private physicians and clinics. Their opinion, as recently given to me, seems almost heretical toward the orthodox practice of medicine. I am informed that they frequently question the reliability of the reports of individual practitioners who serve this type of clientele, and have much more faith in the opinions they get from the clinics.

THE MODUS OPERANDI

What is the practical approach to grouping physicians?

A few county medical societies have attempted to give complete services to persons who could pay a small amount. The set-up has been an office, either telephone station or in charge of a social worker at their headquarters, where requests were received and the patient sent to a selected list of their society membership, who would give them general examinations, special examinations, x-ray, etc., at reduced cost in their respective offices. The service has not been very attractive to customers, and it has two tremendous drawbacks. It involves several hundred doctors in a loose unit and forces a patient to go here for an x-ray, there for a laboratory test, in another direction for a surgeon. To effect economies in group practice, and more important, to improve organization progressively, it is almost essential that the plan be carried out under one roof and with very definite and competent management.

The government does not seem to be interested in the problem of better grouping of physicians. No expression of opinion, projected developments, or plans have come from those in authority.

The real medical unit is the hospital, dispensary, or medical school. Here are found adequate clinical facilities. Usually doctors center about the hospital no matter where their offices are. Furthermore, their practices interrelate in regard to referring patients, consultations, etc. The hospital has buildings, equipment, financial stability, managerial experience, and usually a liberal outlook. During the past twenty years, the whole trend in hospital practice has been toward formal and informal grouping—limited to the charity services, however, rather than pri-

vate medical care. It is therefore the logical place for the development of private group practice. The average hospital group, however, is made up of doctors like any others. If they cannot be persuaded of the benefits of the group idea and prefer their individual practices, the scheme falls of its own weight. The directors of hospital boards are subject to the same limitations of public opinion as are physicians. In addition, unless unusual leadership is present, they may not want to start something which will cause criticism of their institution by outside doctors and others, for subsequent fund raising may suffer. Also, to be workable, financial and medical management of private group practice in a hospital and clinic must be closer and more progressive than that which the average open or semi-open hospital staff has at its disposal. It is for these reasons that the important spread of group practice has been in university clinics or well-endowed institutions.

A second mode of spread has been in small privately owned clinics, frequently centered about a successful physician or surgeon. As indicated in a recent survey by the American Medical Association, the mortality of these institutions is high. Personality difficulties, lack of business management, and other reasons limit their development. Nevertheless, the private group clinic is slowly spreading in certain parts of the country—notably the far west; to some extent in the mid-west; scarcely at all in the east.

The kind of clinic which it seems to me would be successful in the medical sense, i.e., one that is a contribution to the economics of medical care, both from the standpoint of the physician and the patients, is somewhat as follows: There must be sufficient volume of work to maintain and develop specialties, hence there must be a considerable number of patients, say 50 to 100 visits per day at least. All medical services are to be given, though all need not be started at once (e.g., house calls, obstetrics). As indicated, there is to be an attempt at considerable specialization, but, as definitely stated, how much is a matter demanding considerable direction, and perhaps development. There must be a brand of medical leadership competent enough and clothed with sufficient authority to make changes without the interference of internal politics and personality difficulties which have wrecked so many of these group medical efforts.

"The place of the family practitioner" in the scheme, need not cause the concern that some have felt. An integral part of the group, he may do the bulk of the medical work, and it is assumed that he will develop competence in the handling of particular diseases as he does now in the free dispensaries and hospitals. However, he will always have expert advice available and continually be in contact with all branches of medicine. Within these limits the attempt can be made to preserve his individuality and that of the patient. The best organized groups operate by having one physician responsible for all diagnostic findings on every patient and for all treatment processes. The general practitioner can and should be the central figure in this process for the bulk of the clientele.

All doctors need not spend their entire time in the clinic. Many of them, both general practitioners and specialists, may keep their private offices and work in the clinic at specified times—at least at first.

All financial dealings are to be made with a central business office, preferably associated with the type of social service which free dispensaries have be started at once (e.g., house calls, obstetrics). As but in a more limited degree. Some or all physicians may be paid on an hourly basis, varying with the clinic's income and the physician's experience and service given. An attempt might be made (perhaps later) to adjust the remuneration to different earning capacities of members, but these differences in physicians' incomes are not to be so great as obtain in private practice.

If most services are to be made available to low income groups, the clinic cannot carry a heavy burden of rent, or interest on building, equipment, etc. Even with all the advantages of grouping the doctor cannot be public servant and private merchant—give the patient all he needs, maintain himself on a profit basis—for many of these people. In spite of objections which have been voiced, there is enough precedent in hospital practice, where the physician makes his living in premises which were constructed by philanthropic funds, to justify philanthropy in providing premises where he can treat ambulant patients for a fee. There still will be a certain number of expensive examinations, tests, etc., where patients can pay only a portion of the cost (e.g., patient can pay $2.50 for gastro-intestinal examination but the cost to the clinic is $5.00). A fund to supplement these fees, perhaps on the tentative principle that if the patient can pay 50 per cent of the cost, the fund will pay the remaining 50 per cent, would go a long way. This fund would not have to be very large, all things considered, to eliminate considerable "charity medicine".

SUMMARY

In summary, the doctor's training, daily routine of personal service, and individual viewpoint contain elements which make his acceptance of coördinated endeavors slow.

The personal relation between physician and patient and the doctor's professional status need not suffer in group practice. "Rugged individualism" is waning in medical thought as it is in other branches of human endeavor.

Group practice can lower expense.

In certain regards, private practice is inadequate, both from the standpoint of the physician and the public. On purely professional grounds, there is need for better coördination of medical services, and grouping, such as one sees in well-organized hospitals and clinics, offers educational advantages which private practice does not.

Group practice has developed on hospital and clinic staffs and in private groups. The general practitioner can and should be associated with groups along with the specialists, for his own benefit as well as for that of his patients.

The efficiencies and economies of grouping are bound to win out in the long run, for "whatever is best for the American people will, in the long run be best for the physicians who serve them".

MEDICAL AND PUBLIC HEALTH ATTITUDE TOWARD SMALLPOX VACCINATION AND DIPHTHERIA IMMUNIZATION*

BY GEORGE T. PALMER, DR. P.H.,† AND MAYHEW DERRYBERRY, PH.D.†

ONE of the objectives of public health work is the control of communicable diseases. Two of these diseases, smallpox and diphtheria, have their greatest mortality among preschool children. For each an effective preventive is known. Yet the White House Conference Survey* showed that among the preschool children of 156 cities only 21 per cent had been vaccinated against smallpox and an equal percentage had been immunized against diphtheria. Such low proportions prompted an investigation of the attitudes of the immunizing agencies toward these two measures. No attempt is made here to determine the attitude of the private practitioner as opposed to the public health agencies. Rather it is the purpose of this paper to examine indirectly the manner in which the immunizing agencies are functioning and to indicate from the results obtained some of the possible weaknesses of the present procedures.

ATTITUDE TOWARD EARLY VACCINATION AND IMMUNIZATION

Although 21 per cent of all the preschool children have been immunized against diphtheria and the same proportion have been vaccinated against smallpox, yet only 11 per cent of the group have received both of these protective services. Even among children ready for school entrance (the five-year-olds) the proportion protected against both diseases is only 22 per cent. Compare this latter proportion with 44 per cent of five-year-olds who have had vaccination, and with 32 per cent who have had immunization. Such a comparison reveals that 50 per cent (22 out of 44) of the five-year-old vaccinated children have been immunized, and 66 per cent (22 out of 32) of the immunized five-year-old children have been vaccinated. In other words the probabilities of a five-year-old child being vaccinated, if he has been immunized, is about one and one-third times as great as his chances of being immunized if he has been vaccinated.

But these probabilities are not the same for the lower age groups. In fact the situation is quite the reverse. Among the younger children the probabilities of immunization among vaccinated children are much greater than the probabilities of vaccination if a child has been immunized. This difference in proportions is at a maximum at one year of age. (See Chart I.)

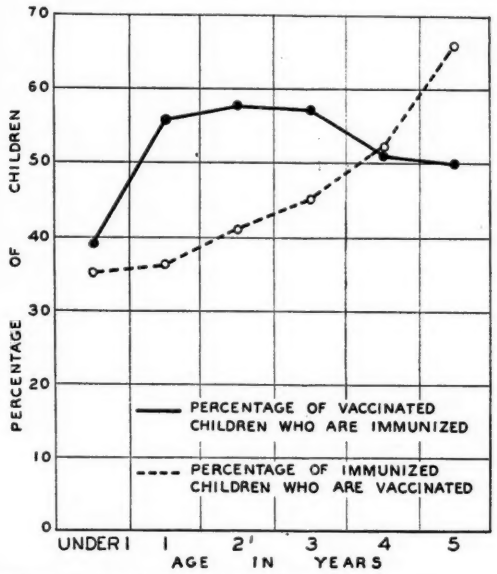

CHART I. Relative public health emphasis on the immunity measures at each age.

These facts reveal very clearly an attitude of the agencies administering the immunity measures. They are more interested in protecting the young child from diphtheria than they are in vaccinating him against smallpox.

When a young child comes in for vaccination his chances for both vaccination and immunization are considerably greater than when he comes in for immunization. In other words the prophylactic agencies, whether they be private or public, are not pushing vaccination and immunization to the same degree. If it be true that smallpox vaccination is being taken too much for granted, then here is reflected an attitude among the public health agencies that needs to be corrected.

This discrepancy between the interest in vaccination and immunization is further confirmed when we consider the relative amount of protection of each type that different children in the same families have received. Of 5591* families in which there are two children of different ages under six, there are 333 in which the younger child has been vaccinated when the

*The study is based on the data collected during the White House Conference and reported in "Health Protection for the Preschool Child" by Palmer, George T., Derryberry, Mayhew, and Van Ingen, Philip. The study was financed by the Follow-Up Committee of the White House Conference.

†Palmer, George T.—Secretary, New York City Board of Health, 1934. Derryberry, Mayhew—Associate Director of Research Service, American Child Health Association 1934-. For records and addresses of authors see "This Week's Issue," page 426.

*These represent only native-born families in two extreme economic status groups. The extra burden of the work involved prevented a more inclusive amount of data. The conclusions are substantiated in each economic status and in each size of family.

older sibling has been immunized, and 449 in which the younger child has been immunized when the older child has been vaccinated. Among 3086 families with three children of different ages the corresponding figures are 292 and 398 respectively†. When these comparisons are made by specific ages (using the age of the younger child for purposes of classification) the same conclusions hold.

TABLE 1

RELATIVE EMPHASIS OF PUBLIC HEALTH AGENCIES ON VACCINATION AND IMMUNIZATION OF SIBLINGS

Age of Younger Child	*Families With Two Children*		*Families With More Than Two Children*	
	Proportion of Younger Children Vaccinated When Older Sib. Is Immunized	Proportion of Younger Children Immunized When Older Sib. Is Vaccinated	Proportion of Younger Children Vaccinated When Older Sib. Is Immunized	Proportion of Younger Children Immunized When Older Sib. Is Vaccinated
Under 1	3	7	3	5
1	18	26	12	23
2	26	41	24	32
3	39	39	32	36
4	45	42	38	46

It is evident from these data that the attitude of the agencies responsible for administering immunity measures is less favorable toward vaccination of the young child than toward immunization*. Naturally we should expect public health agencies to promote the newer measures of immunization against diphtheria, but it hardly seems efficient to concentrate on the prevention of diphtheria and tend to neglect the prevention of smallpox. Even though the incidence of smallpox has been reduced to a very low point, is it likely that this low level can be maintained if widespread vaccination among young children is not continued?

HEALTH EDUCATION COINCIDENT WITH VACCINATION AND IMMUNIZATION

Vaccination against smallpox and immunization against diphtheria need not be merely services rendered to the family by a health agency. They may be, and should be, educational experiences for the parent in the value of such services. This occasion of contact with the family would seem to offer an opportunity of emphasizing more effectively the meaning of a health protection practice than would general publicity at other times.

To what extent then are our health agencies engaged in such a program of effective education? We may obtain some index of the degree to which such a program is functioning by the extent to which families with more than one child in the family protect all their children when one child has been protected. If efficient education accompanies immunization then the protection of the older child would be associated with protection for the younger child and vice versa. Once convinced of the value of the service, the parent would insist on the service for all children without further social urging. On the other hand if the immunization process is merely a health service to the family with no parental education associated with it, then the younger child would not always be protected when the older sibling had had the service, for the protection might have been given the older child before the younger child was born.

With these considerations in mind we selected from the families with two children all those in which the older child had been protected from diphtheria. We then determined the proportion of these families in which the younger child had been immunized against diphtheria. We next selected from the families with two children all those in which the younger child had been immunized, and determined the proportion of these in which the older sibling had been immunized.

Among the 1711 families in which the older child had been immunized only 771 or 45 per cent of the younger children were so protected. On the other hand, among the 793 families in which the younger child had been immunized, 771 or 97 per cent of the older children had been protected. The corresponding proportions for vaccination against smallpox are 31 and 96 respectively.

Such wide discrepancies as these would not occur if the agency responsible for administering the immunity measures were efficiently educating parents to understand the advantages of early protection against these two communicable diseases. If the procedure of efficient education were followed, then families in which an older child was protected would also have the younger child protected. But these discrepancies occur in every age combination for both vaccination against smallpox and immunization against diphtheria*. Not only do the discrepancies oc-

†In obtaining these figures each child was paired with the other two, therefore there are three pairs of children within each family.

*The replies of 2374 medical men to a questionnaire sent out by the White House Conference Committee on Medical Care for Children confirm this conclusion. The men to whom the questionnaire was sent were either practicing pediatrics or especially interested in pediatrics. Ninety-one per cent of them state that they "specially urge" immunization against diphtheria and 7 per cent "give it only when asked." On the other hand, 14 per cent state that they "do not suggest vaccination unless parents ask for it." Yet 82 per cent of the doctors report that "nearly all" the parents are favorable toward vaccination and only 52 per cent of the doctors report "nearly all" parents are favorable toward immunization.

*Complete data are in our files and will be supplied on application.

TABLE 2

PROTECTION FOR BOTH CHILDREN IN THE FAMILY WHEN ONE CHILD HAS BEEN PROTECTED

Families With Two Children in the Family

Difference in Age	Proportion of Children Protected: Older, When Younger Is Protected Against: Diphtheria	Smallpox	Younger, When Older Is Protected Against: Diphtheria	Smallpox
1 Year	98	94	71	56
2 Years	98	98	58	40
3 Years	96	94	37	23
4 Years	92	95	20	15
5 Years	100	60	7	2

Families With Three Children in the Family

Difference in Age	Proportion of Children Protected: Older, When Younger Is Protected Against: Diphtheria	Smallpox	Younger, When Older Is Protected Against: Diphtheria	Smallpox
1 Year	98	96	61	50
2 Years	98	97	50	34
3 Years	99	98	19	13
4 Years	100	100	4	1
5 Years	1*	1*	0	0

*In none of the families having a five-year-old and a child under one were any of the latter immunized or vaccinated. Therefore these proportions are indeterminate.

cur in every age group, but they increase as the differences in age between the children become greater. (See table 2.)

These figures indicate clearly that immunization against diphtheria and vaccination against smallpox are services rendered to the family without the accompaniment of effective education in the importance and value of such procedures. In other words, the immunizing agency tends to protect all the children that are in the family at the time one is protected but does not instill into the parent a conviction of the value of the service so that immunization and vaccination will be demanded by the parent for the next children born into the family.

SUMMARY

1—The coincidental occurrence of smallpox vaccination and diphtheria immunization in the same children is very low. About one out of ten of our preschool children are protected from both diphtheria and smallpox.

2—Two causes suggested for the low amount of complete protection are the following:

a) Agencies engaged in administering the immunity measures are not stressing vaccination for the younger children.

b) No efficient educational program on the value of immunization and vaccination accompanies the immunizing procedure. It is more in the nature of a health service rendered to the family.

MANIFESTATIONS OF A STREPTOCOCCUS INFECTION

BY FAITH L. MESERVE, M.D.*

THE streptococcus is a versatile organism. Scarlet fever in a dairyman in Charlton gave rise to eighty-four cases of septic sore throat while a dairyman with a sore throat in Plymouth originated over a hundred cases of scarlet fever[1]. One and the same strain of hemolytic streptococcus has been said to produce scarlet fever and erysipelas in two members of the same family[2]. I wish here to record a case of streptococcus infection, including erysipelas and scarlet fever in one and the same individual. The essential features of the case are charted herewith.

A student nurse, aged twenty, was admitted to the Medical service of the Waltham Hospital, January 15, 1934, complaining of sore throat, tender cervical glands, malaise and nausea.

The patient's family history showed her mother and father both dying before the age of thirty. In each case there was a question of tuberculosis.

Her past history showed measles, chicken pox and whooping cough in childhood; influenza in 1922; and poison with Rhus toxicodendron, every summer. She had had two operations,—tonsillectomy in childhood, and an interval appendectomy in 1928. In June, 1933 she had a gastro-intestinal infection of three days' duration, characterized by nausea, vomiting, diarrhea and temperature.

Present illness: On admission the patient was examined by the chief of the Medical Service and transferred to the Contagious Service with the following note: "History of nausea, sore throat, swollen, tender glands, leads to a diagnosis of scarlet fever. She seems to be sicker than her physical examination warrants. She may be oversensitive or she may be suffering from a very toxic throat." She was isolated. Cultures of the throat showed hemolytic streptococci.

On January 16 and 17, the patient continued to be acutely ill. She was drowsy, but could be aroused, and was then coöperative and apparently rational, although some of the statements which she made at this time were later proved to be unreliable.

Physical examination showed a well-developed, fairly well-nourished young woman. Her face was flushed. There was a small red area just inside the hair line on the left side of the forehead.

Eyes: Pupils equal, reacting slowly to light and accommodation.

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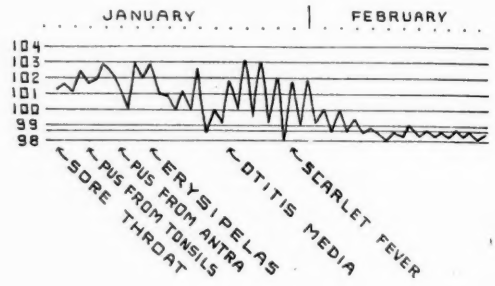
Ears: Negative.
Nose: Marked obstruction.
Mouth: Tongue coated; very red at tip. Foul odor to the breath.
Throat: Red; inflamed; pus on the posterior wall of the right tonsillar fossa.
Neck: Marked cervical adenitis bilateral. Some pain on turning the head, but no stiffness.
Lungs: Clear and resonant throughout.
Heart: Rate 96. Regular. Systolic murmur at the apex; not transmitted. No enlargement to percussion.
Abdomen: Thin; no masses or tenderness.
Reflexes: No abnormal reflexes elicited.

An aural consultant examined the patient. He felt that the pus seen in the nasopharynx came from the sinuses, and found both antra cloudy on transillumination. On January 19 he irrigated the right antrum, obtaining a large amount of pus which showed streptococcus. On January 20 the left antrum was similarly treated with the same result.

On that night, the small area of redness on the left forehead extended downward, involving the left side of the forehead, cheek and neck. There was swelling and a sharp line of demarcation. A diagnosis of erysipelas was made. The patient was given Sherman's erysipelas vaccine No. 1, 0.5 cc., repeated after twelve hours, followed by 1 cc. daily for five doses. A local application of carbolic acid in glycerine and alcohol was used on the involved area. On January 23, urine specimens, which had previously contained only a "slight trace" of albumen with a few cells in the sediment, were reported as showing a "high trace" of albumen, granular and hyaline casts. On January 28, a slight discharge was noted from the left ear. There was more marked edema on the face, although the erythema was less. The blood N.P.N. was 85 mg. per 100 cc. The blood culture was negative. On January 30, the patient showed a punctate rash first involving the chest and arms and then the abdomen, legs and back. This rash was typical of scarlet fever in character and distribution. On February 3, the patient's general condition began to improve. The discharge from the left ear was now profuse and showed hemolytic streptococci. From January 15 to February 3 her temperature was elevated above 100° F. at some time during each day.



On February 14, the patient's condition was much improved. Her toes were noticed to be desquamating. Recovery from this point was uneventful. On February 28 she was discharged well.

SUMMARY: This is a case of hemolytic infection showing the following manifestations: Cervical adenitis, nasopharyngitis, tonsillitis, sinusitis, otitis, facial erysipelas and scarlet fever.

Streptococcus epidemicus, streptococcus erysipelatus, and streptococcus scarlatinae have been reputed to be separate and distinct strains of the streptococcus pyogenes. Certain strains, however, may possess or acquire the properties of the whole family.

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WILL GIVE CHILDREN PARALYSIS VACCINE

Philadelphia, August 20.—Dr. John A. Kolmer, who has announced the development of a vaccine which he believes will immunize human beings against infantile paralysis, said today that he would seek to recruit about twenty children for vaccination in the next few weeks. His own sons, John, Jr., 15 years old, and Daniel, 11, will be among them.

The primary purpose, according to Dr. Kolmer, was to determine the amount of dosage required for the course of three injections, which he believes to be sufficient for lifetime immunity.

Before the children are vaccinated they will be subjected to the serum neutralization test to determine whether they have a natural immunity against the disease. It involves the withdrawal from the patient of a small quantity of blood from which the serum is taken after coagulation and mixed with poliomyelitis virus. This mixture is injected into the brain of a monkey. If the animal becomes paralyzed it shows that the child's blood contained no natural immunity, Dr. Kolmer holds.

Following vaccination another quantity of blood is withdrawn after a certain period, mixed with virus and injected into the monkey's brain. If no paralysis results this should show, Dr. Kolmer believes, that the vaccine has set up anti-bodies in the child's blood which cause immunity.

Dr. Kolmer took cognizance of a statement by Dr. W. Lloyd Aycock, director of research of the Harvard University Infantile Paralysis Commission, who contended that the vast majority of persons had a natural immunity against infantile paralysis and that general vaccination would be unfeasible and hazardous in that there was no guaranty of safety.

"Dr. Aycock would agree with me that we cannot permit children to die, just because some of them might become immune without vaccination," he said.—Special dispatch to the *New York Times*.

EDITORIAL NOTE: The objection stated above as described by Dr. Aycock is certainly a very important feature of the whole study. It warrants definite conservatism on the part of the profession with reference to any active endorsement of the claims submitted by Dr. Kolmer, although credit is due him for his intensive efforts in this work and his ingenuity in the theories advanced.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.

CASE 20351

PRESENTATION OF CASE

First admission. A seventy year old American janitor entered complaining of inability to walk of six months' duration.

Approximately one year before entry the patient began to have pains in his legs. These pains usually occurred while walking or sitting and lasted only a few minutes. Eight months before admission he fell four or five feet and landed on his heels. He believed this incident had nothing to do with his present illness because he was able to continue with his work. Following this however he began to have numbness in his feet and slight difficulty in walking. Six months before entry he was brought home from work because he was unable to walk. The numbness had increased in severity. During the two months before entry he developed numbness of his hands and was unable to button his clothes. Recently he had had some ankle edema. He developed moderate urinary frequency.

His family and past histories are non-contributory. He had been married twice. There were no pregnancies by either marriage.

Physical examination showed a well-developed and nourished man lying rather uncomfortably in bed. His hair was gray. The skin was pale and had a yellowish tint. The mucous membranes were pale. There was a question of a slight icteric tint to the sclerae. The pupils were slightly irregular and reacted well to light and accommodation. All of his teeth were missing. The tongue was rather smooth, especially at the margins. The heart was slightly enlarged to percussion. There was a loud blowing systolic murmur at the apex and the base. The brachials and radials were palpable and slightly tortuous. The abdomen was protuberant. The liver edge was felt two fingerbreadths below the costal margin. There was marked pitting edema of the lower legs. Neurological examination showed slight general weakness of the muscle groups. The strength however was equal on both sides. Sensation to pin prick, light touch, heat and cold was normal. Tuning fork vibration could not be felt in the upper or lower extremities. Sense of position was absent in the toes and fingers. There was marked astereognosis. The finger to nose test was done rather poorly and jerkily. His memory was poor for recent and distant events. The abdominal and cremasteric reflexes were absent on both sides. The knee-jerks and ankle jerks were present. The plantar reflexes pointed downward on the right and upward on the left.

The temperature was 98°, the pulse 89. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 1,860,000 and a hemoglobin of 50 to 55 per cent. The smear showed very slight achromia, marked variation in size and shape and occasional stippling of the red cells and many macrocytes. The white cell count was 5,750. A spinal fluid examination, including a Wassermann test, was negative. Gastric analysis showed no free hydrochloric acid after alcohol and histamine.

He responded well to digitalis. He was given an anemia diet plus one pound of raw liver daily. His walking did not improve, although he was forced to walk nearly every day in a supporting frame. His reticulocyte count on the fifth day was 6.6 per cent. He was discharged at the end of eight weeks. At that time his red cell count was 4,020,000, with a hemoglobin of 65 per cent.

History of interval. He did well for eighteen months after his discharge and was very happy and contented. He was unable to walk however unless aided. He took digitalis for only two months after discharge, but took one pound of liver daily. Approximately one month before his second admission his wife noticed that his abdomen was swelling. Two weeks later he caught cold, characterized by coryza and slight cough. He had no chills, fever or pain. The cough however continued, but was unproductive until two days before entry. At that time he began to raise a large amount of thick yellowish sputum. He had no pain, but his color became a "ghastly gray". He developed shortness of breath and was unable to void. On the day of admission he became very drowsy, sweat profusely, and was unable to recognize his wife. He took a small amount of food, but had great difficulty in swallowing it.

Second admission, a year and seven months after his first.

Physical examination showed a well-developed and well-nourished man sitting up in bed in a semicomatose condition and breathing very rapidly. His lips were cyanotic. The skin was lemon yellow and very pale. There was flatness with distant bronchial breathing at the right base posteriorly and a few moist râles over the right chest. In the midchest there was an area of bronchophony. The heart was markedly enlarged. The sounds were distant.

The blood pressure was heard only at 60. There was marked edema of the legs. The abdomen was very pendulous, with some dullness in the flanks. Further examination was impossible because of the condition of the patient.

The temperature was 101°, the pulse 120. The respirations were 48.

Examination of the blood showed a red cell count of 5,200,000, with a hemoglobin of 80 per cent. The white cell count was 38,000, with 96 per cent polymorphonuclears. The smear showed moderate variation in the size and shape of the red cells, with occasional large well-filled cells. The shape of the cells was fairly normal. The platelets were normal.

A chest tap was performed immediately and yielded 850 cubic centimeters of thick purulent fluid. A culture showed hemolytic streptococcus. He was given nine grains of digitalis intramuscularly in the Emergency Ward at noon. The same dose was repeated in four hours. He was also given 1000 cubic centimeters of 10 per cent glucose intravenously. Later in the day his chest was again tapped and 1,100 cubic centimeters of pus was removed. He steadily went downhill and died that evening.

Differential Diagnosis

Dr. Wyman Richardson: I really have not much more to say. At the first admission a definite diagnosis of pernicious anemia must surely have been made. The story is very typical, and the blood findings are also typical.

There are two points in the story that might be spoken of. I think it is rather unusual to have pain in the legs with combined system disease in pernicious anemia unless there is considerable spasticity. He fell perhaps because of an ataxia which was already beginning. I do not believe his fall had any bearing on his symptoms.

Physical examination showed a man lying rather uncomfortably in bed, we are not told just why. One gets the impression that he was uncomfortable because the bed was uncomfortable. The physical examination is quite consistent with the combined system disease of pernicious anemia. One gathers that the picture was rather more one of ataxia and lack of muscle coördination than of spasticity.

In the examination of the blood smear slight achromia is noted in spite of a high color index. That of course is not typical of pernicious anemia, but I think the reason for such a notation is that there frequently is considerable variation in the amount of hemoglobin in the cells.

He responded well to digitalis. He also was given a pound of raw liver daily. I should say that he responded well to liver; but he was also given digitalis. I do not believe it was the digitalis that did the work.

His reticulocyte count was not so high as expected; 6.6 per cent reticulocytes occurred on the fifth day.

I should say that he definitely had pernicious anemia, combined system disease and very little evidence of any cardiac difficulty.

In the interval he is given one pound of liver daily, which is adequate; but if we had the problem at the present time we should also give him intramuscular liver in the hope of improving his central nervous symptoms.

Then something else happens; the abdomen begins to swell. Usually if that is noted carefully by some member of the family it means a great deal, and usually it means fluid in the abdomen. I do not know why in this case.

Then he began to have cough, but nothing much happened. He apparently had what one would think of as an ordinary cold until two days before admission. The time relations are not clear. Evidently the history could not be taken from the patient, so we cannot complain. We have to do with what we have.

On examination they found a greatly enlarged heart and signs of considerable fluid at the right base. I wonder how they concluded he had an enlarged heart. In view of the amount of fluid I think it might have been rather difficult to be sure he had an enlarged heart. We are told that the skin was lemon yellow and very pale, but when we come down to the examination of the blood we find he has a red cell count of 5,000,000 and a hemoglobin of 80 per cent. He is in collapse at this time, and there might be increased venous stasis, but not enough to change a severe anemia into a high normal red cell count.

Finally a chest tap was done and pus found containing hemolytic streptococcus. He died soon after that.

I wonder about the advisability of giving a man who is in circulatory collapse 1000 cubic centimeters of fluid intravenously. I think I should be rather inclined not to give so much fluid intravenously.

We have then to account for this man's death. We know he had an empyema. Where did it come from? Of course the natural cause of empyema would be pneumonia. It does not seem to me that the history suggests pneumonia. He did have an infection of some sort which seemed to be an ordinary cold. I am doubtful therefore whether it is empyema due to pneumonia.

Pernicious anemia patients sometimes die of thrombosis, a phlebitis which is often septic, or sometimes arterial thromboses in the brain, the heart or the mesentery. We have had several cases down here, one particular one with a sep-

tic infarct and empyema following that. In pernicious anemia one must think of the possibility of a septic infarct in the lung followed by empyema. However, there seems to be no evidence of any such sequence of events here, and we come down to an unexplained empyema. I am inclined to consider the possibility of a primary streptococcus empyema. I think also that it is very likely that he has a septic pericarditis, although there is very little evidence on which to base such a diagnosis. I should say that he had pernicious anemia and combined system disease which was well controlled.

Clinical Diagnoses

Pernicious anemia.
Combined system disease.
Empyema.
Arteriosclerotic heart disease.
Congestive failure.

Anatomic Diagnoses

Pernicious anemia.
Combined degeneration of the spinal cord.
Gliosis (of degenerated portions).
Septicemia, hemolytic streptococcus.
Bronchopneumonia, right basal lobe.
Empyema, right.
Interlobar empyema, right primary fissure.
Arteriosclerosis, marked coronary, aortic and renal.
Cortical cysts of kidneys.
Obesity.
Prostatic hyperplasia, moderate.

Pathologic Discussion

Dr. Tracy B. Mallory: The autopsy on this man showed a well marked combined system disease about which I will ask Dr. Kubik to tell us. It is interesting to examine material from these patients in whom definite clinical improvement has occurred because it gives us a clue to the mechanism of the reparative process.

In the body itself we found of course the empyema, in fact two empyema cavities since there was a small encapsulated one between the middle and lower lobes. There was a pneumonia at the right base, and hemolytic streptococci were grown from both lung and pleural cavity. The heart was normal in size. There was considerable degree of arteriosclerosis. The abdominal cavity was perfectly dry. The only explanation we can offer for the swelling of the abdomen is obesity, which was considerable.

Dr. Charles S. Kubik: I have wanted for a long time to examine the spinal cord in a case of this kind which had improved under liver treatment. There was degeneration with the usual distribution, that is mainly in the posterior and lateral columns, but instead of the characteristic vacuolation or honeycombing without proliferation of fibrous glia there was very marked gliosis and no honeycombing. The findings unquestionably indicate that the progress of the disease had been arrested, or slowed down sufficiently for gliosis to take place.

The gliosis is an incidental affair and only indicates that the degenerative process has subsided and the degenerated tissues have been replaced by fibrous glia. In the untreated cases gliosis does not take place to any appreciable extent, probably because of the severity of the disturbance and its rapidly progressive course.

I should like to know what changes had taken place in the patient's symptoms and signs, particularly in the numbness and tingling, reflexes, and sphincter disturbances.

Dr. Alfred Kranes: He was so sick that he could not be thoroughly examined.

A Physician: Why should gliosis have anything to do with the improvement of symptoms?

Dr. Mallory: Gliosis in the central nervous system is essentially equivalent to scar formation elsewhere in the body and is the normal process of repair.

CASE 20352

Presentation of Case

First admission. A forty-eight year old divorced American saleswoman entered a year and ten months before her final admission.

For the past ten years the patient had painless swelling of the ankles in the evening and occasional headaches and dizzy spells upon rising in the morning. Two years before entry she noticed that she tired very easily. Six months later she began to lose strength and the headaches increased in severity. This condition progressed so that fourteen months before entry she was forced to give up her work and remain at home. She improved somewhat until eight months before entry, when following a chronic tonsillitis she lost all her strength. She remained in bed most of the winter and was never up for much more than a week. She had occasional blood-tinged sputum in the morning. Her headaches were usually over the parietal areas and pressing in character. She averaged at this time about one headache a month and it occasionally lasted as long as four days.

Her mother died of cancer, her father of typhoid fever. Four siblings were living and well. One sister died of shock and high blood pressure.

She had been married twenty-seven years and divorced four years. She had eight children all of whom were living and well. There were no miscarriages.

She had had the usual diseases of childhood. There was no history of scarlet fever or rheumatism. Fifteen years before admission she

had an attack of typhoid fever. She had always been subject to sore throats and tonsillitis during the winter.

Physical examination showed an obese middle-aged woman lying quietly in bed. Her pupils were slightly irregular and reacted to light and accommodation. The fundi showed marked narrowing and tortuosity of the vessels. The discs were blurred. There were numerous small areas of exudate and degeneration. The nose was moderately obstructed on both sides. The right tonsil was enlarged but not injected. The heart could not be percussed accurately because of marked obesity. It was regular. There were no murmurs. The aortic second sound was very loud, the pulmonic second sound split. The brachials were slightly tortuous. The blood pressure was 276/130. The liver edge was not felt, although there was a sense of resistance about one and a half fingerbreadths below the costal margin. There was slight pitting edema of the lower legs.

The temperature was 98°, the pulse 75. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 4,700,000, with a hemoglobin of 80 per cent, and a white cell count of 7,500, with 72 per cent polymorphonuclears. A Hinton test was negative. The stools were negative. The basal metabolic rate was plus 7. A urine concentration test showed specific gravities of 1.020, 1.034, and 1.028. A phenolsulphonephthalein test showed 63 per cent excretion in two hours, 23 per cent in the first fifteen minutes. A urea clearance test showed normal function.

X-ray examination of the chest showed enlargement of the heart downward to the left and in the region of the right auricle. The supracardiac shadow was definitely above normal. The aortic knob, however, was not prominent. Pulsations under the fluoroscope were marked at the base of the aorta. No definite enlargement of the aorta was noted. The transverse diameter of the heart measured 15 centimeters, 9.8 to the left of the midline and 5.2 to the right. The transverse diameter of the chest measured 23.2 centimeters.

She remained in bed on the ward for about two weeks and her blood pressure went down to 240/78. She received 600 R units of radiation in two doses over both adrenals. She was discharged on the sixteenth day and given a thousand calorie diet.

History of interval. She had been taking phenobarbital and had had one venesection in the Outpatient Department. Her weight had decreased from 204 to 137 pounds. She was seen in the Outpatient Department eleven months before entry and was put on digitalis. Two months before entry she began to have pain over the heart radiating down both arms. Edema of the ankles was still present. Her headaches, however, had disappeared.

Second admission, a year and five months after her previous discharge.

Physical examination was essentially the same as at her previous admission. The blood pressure was 275/140. There was a systolic murmur over the pulmonic area. The liver edge was palpable two fingerbreadths below the costal margin.

The laboratory findings were similar to those of her previous admission except that a phenolsulphonephthalein test showed only 30 per cent excretion, 5 per cent in the first fifteen minutes. There was no definite change in the appearance of her heart by x-ray.

It was felt that total ablation of the thyroid was not advisable for the following reasons: (1) she was too happy and comfortable leading an easy life at home, (2) her chief symptoms were headache and weakness which were accounted for by her hypertension, and (3) her renal impairment and retinal changes. She was discharged six days after entry.

History of interval. Since her discharge she was followed in the Outpatient Department. She had been treated with digitalis, a grain and a half daily, and had also received x-ray treatment to the adrenals. The blood pressure hovered around 285/170. She felt fairly well, although she did have loss of strength. Four weeks before entry she developed a constant severe headache, localized to the occipital region, and a sharp knife-like pain over her eyes, more marked on the right. Her vision became poor and when seen in the Outpatient Department eight days before entry her fundi showed choking of the discs. A venesection was performed at that time without benefit. She had shortness of breath on exertion, palpitation, and a knife-like pain under the sternum with a squeezing sensation. She developed nocturia, three to four times, and also polydipsia.

Third admission, four months after previous discharge.

On physical examination the heart was pounding, the rhythm regular. The blood pressure was 260/155. There was a systolic murmur over the precordium and a diastolic thrill in the left third interspace. The apex impulse was double. The liver edge was felt four fingerbreadths below the costal margin. The fundi showed choking of the discs and a few hemorrhages.

The temperature was 98°, the pulse 130. The respirations were 26.

Examination of the urine showed a specific gravity of 1.004-1.010, a slight trace to a trace of albumin, and no sugar. The sediment showed occasional white cells, red cells, and granular casts. The blood showed a red cell count of 3,400,000, with a hemoglobin of 55 per cent, and a white cell count of 11,000, with 80 per cent polymorphonuclears. The non-protein ni-

trogen of the blood was 55 milligrams. A phenolsulphonephthalein test showed 10 per cent excretion in one hour.

The patient vomited somewhat during her stay and became very weak. An aortic diastolic murmur was heard, as well as a marked gallop rhythm. Approximately two weeks after entry she developed many petechiae. The non-protein nitrogen rose to 95 milligrams and terminally to 160. She was given intravenous glucose but steadily went downhill and developed twitching of her muscles. She was given 10 cubic centimeters of 5 per cent calcium chloride which failed to stop the twitching. She died approximately six weeks after entry.

Differential Diagnosis

Dr. William B. Breed: To go back to the original complaint, a woman of forty-eight who began at forty-six to complain of weakness and dyspnea suggests among the most likely probabilities that she is a cardiac of some sort. As a matter of fact the weakness began before the dyspnea, so that one cannot lay too much stress on the dyspnea as indicating heart disease. Assuming that this is heart disease, I think it is just as well to approach it from an etiologic point of view and ask what sort of heart disease it may be. It would seem to me that beginning at forty-six, if the history is correct, it is either a luetic or a hypertensive process, presumably not rheumatic. She is too young to have solely an arteriosclerotic process, and I should be very much against the diagnosis of rheumatic heart disease from the history. That leaves malignant hypertension or possibly syphilitic heart disease.

She had painless swelling of the ankles and dizzy spells upon rising in the morning. That leads us up to the point of early hypertensive disease with occasional headaches and dizzy spells. She tired very easily for two years; six months later she began to lose a great deal of her strength and her headaches increased in severity. About this swelling of the ankles in the evening—I do not believe we can lay too much stress on that. In the first place, she may be obese, and as you know a great many obese people have swollen ankles toward evening without any insufficiency of the circulation at all. Ankle edema may have been given too much prominence in the history. We do not know moreover whether it was pitting edema. Her symptoms seemed to be progressive and she finally had to stay at home. However, she improved somewhat after rest until eight months before entry, when she had "chronic tonsillitis" and then lost her strength. Chronic tonsillitis as such is a vague term and I think it is used too loosely—just as the term chronic appendicitis is.

The fact that she was never up for more than a week and had occasional blood-tinged sputum does not mean very much to me. We do not know how much sputum she had or how much she coughed during the day. It could occur in hypertension or rheumatic heart disease with mitral stenosis and beginning failure. Blood-tinged sputum in the morning in itself does not necessarily lead to a diagnosis of pulmonary disease.

"She averaged about one headache a month and it occasionally lasted as long as four days." These headaches are apparently becoming more prominent. We do not know whether she had any dimness of vision or vertigo, though she did have some dizziness. A definite line of distinction must be drawn between dizziness and true vertigo. True vertigo occurs in definite attacks, with presumably nystagmus and falling, and should be sharply distinguished from giddiness and feeling of unsteadiness which the word dizziness usually implies. I gather from this that she was just a little light-headed and dizzy. She had no unconsciousness. The headaches may have been a result of hypertension or of increased intracranial pressure due to a brain tumor, which would account for a good many of these symptoms. Of course she may have some disease of her central nervous system such as lues, etc., but I do not think we need drag in too many differential diagnoses.

"Her mother died of cancer." I think it would be of some interest to know how old her mother was when she died of cancer.

"One sister died of shock and high blood pressure." It does not give her age. In cases of suspected malignant hypertension it is helpful often if one can get the average age of the forebears. A statement regarding only one relative is of little value.

The marital history shows a pretty clean bill of health so far as lues is concerned. I think that is of considerable importance.

The fact that she did not have scarlet fever or rheumatism is of importance but does not rule out rheumatic heart disease, because in this part of the country about twenty-five per cent of the people who have rheumatic heart disease do not have episodes of true rheumatic fever with polyarthritis.

"She had always been subject to sore throats and tonsillitis during the winter." There is her tonsillar history which may be important in the diagnosis of heart disease.

"Her pupils were slightly irregular and reacted to light and accommodation." Her pupils are all right. Slightly irregular pupils are very common. They apparently were equal.

The fact that the fundi showed marked narrowing and tortuosity of the vessels and blurred discs can perfectly well be accounted for on the basis of malignant hypertension. There were numerous small areas of exudate and degenera-

tion, a finding also consistent with that disease.

"The heart could not be percussed because of the marked obesity." Of course percussion of the heart in an obese person is notoriously inaccurate.

"The blood pressure was 276/130." Both systolic and diastolic pressures are extremely high.

So far as I can see, everything in the physical examination is consistent with malignant hypertension. Her blood picture is entirely normal. Her urine concentration test is all right. Her kidneys seem normal enough at this stage, so that we are not able to explain this slight edema on renal insufficiency. I do not know whether she had in addition to her obesity some varicosity of her veins which also might give this swelling.

"There were no murmurs." One would expect to get with this picture a basal systolic murmur.

There is no very definite evidence yet that she had advanced arteriosclerosis of the aorta and heart, but the picture is still consistent with essential hypertension.

"The transverse diameter of the heart measured 15 cm., of the chest 23.2 cm." The heart shows definite enlargement.

"She received during her stay 600 R units of radiation in two doses over both adrenals." That is one of the newer tricks in the treatment of hypertension. Experience in this hospital with radiation of adrenal or pituitary glands, or both, caused no striking change in the blood pressure levels or symptoms in eight cases.

We come now to her second admission. Her weight had decreased from 204 to 137 pounds. That is an extraordinary loss of weight.

"She was put on digitalis eleven months before entry." That can only be regarded as a therapeutic gesture.

"Pain over the heart with radiation down both arms." Hypertension is a common background for angina.

I do not know why her headaches had disappeared. She lost a great deal of weight, perhaps that was a factor.

"The liver edge was palpable two finger-breadths below the costal margin." She is perhaps getting some chronic disturbance here, but such a finding does not of itself indicate cardiac failure.

"It was felt that a total ablation of the thyroid was not advisable." She was apparently sent in for review as to whether the thyroid should be removed.

"Her blood pressure hovered around 285/170." That is an extremely high diastolic pressure.

The patient's history shows that she is running the gamut of the symptoms of her condition. I feel as if we ought to consider the possibility of this woman's having a brain tumor, although she had had hypertension for some time. There is no reason why she should not have a brain tumor simply because she is a known hypertensive. If is often hard to tell the difference in the eyes, etc., between the results of brain tumor and malignant hypertension. Such a diagnosis should be mentioned at least.

"She developed nocturia three to four times and also polydipsia." The polydipsia indicated disturbance in sugar metabolism; the nocturia will go with her failing renal function.

The diastolic thrill in the left third interspace may be due to an insufficiency of the aortic valve without real aortic valve damage, although one does not usually associate a real thrill with insufficiency and I question if this is a true thrill.

DR. BENJAMIN CASTLEMAN: The thrill was felt by a house officer when she was first admitted. The visiting man did not feel it.

DR. BREED: I should be willing on the basis of probabilities to throw out the observation that there was a diastolic thrill in this area. A pericardial friction rub may have been felt.

The hemoglobin was 55 per cent, the red cell count 3,400,000. She is having the secondary anemia that is so frequent with this type of disease. Even the initial non-protein nitrogen of 55 is somewhat increased in level, and of course the terminal figure of 160 correlating with the appearance of vomiting and muscular twitchings indicates a terminal uremic state.

They did the best they could for her. They treated her with x-ray over the adrenals, and finally gave her glucose, calcium, etc.; but it seems to me to be the obvious steady march of malignant hypertension all the way through, with first the vascular changes due to the hypertension and symptoms therefrom and then involvement of the heart and finally the kidneys. Often these cases develop diabetes too, but sugar did not appear in her urine. I should suppose her terminal event was a combination of uremia and heart failure. Everything is certainly explicable on that basis. I think the question of brain tumor is quite remote. Has anyone any suggestions?

A PHYSICIAN: What is the significance of the petechiae?

DR. BREED: I think they occur in the late stages of uremia.

A PHYSICIAN: The white cell count went up.

DR. BREED: You view it as an endocarditis? I do not think we have to go necessarily into the question of endocarditis to account for the petechiae in the presence of uremia.

A PHYSICIAN: I should like to ask about the quality of heart tones in these arterioscle-

rotic cases. Is the so-called metallic tone significant?

DR. BREED: Much is said about the metallic tones of the heart in arteriosclerotic degeneration. I personally do not associate a metallic tone with arteriosclerotic heart disease. I do not know that there is association of the metallic sound with any particular type of heart disease. Of course one gets a ringing aortic second sound with a hypertension.

A PHYSICIAN: What about the double apex impulse?

DR. BREED: That is a "cagey" observation. The observation of the double impulse at the apex is a very fine one. One often hears a split second sound or a reduplicated second sound. I pass over that double impulse because I do not understand it.

A PHYSICIAN: I am still interested in the petechiae.

DR. BREED: We may even find gross intestinal hemorrhages in uremia.

CLINICAL DIAGNOSES

Malignant hypertension.
Chronic nephritis with uremia.
Pericarditis.

ANATOMIC DIAGNOSES

Malignant vascular nephritis.
Cardiac hypertrophy, hypertensive type.
Arteriosclerosis: marked coronary, slight aortic.
Bronchopneumonia.
Hemorrhage into ileum and colon.
Petechial hemorrhages in gastrointestinal and genitourinary tracts.
Hydrothorax, slight.

PATHOLOGIC DISCUSSION

DR. CASTLEMAN: She had a fairly large hypertensive heart. It weighed five hundred and seventy-five grams, which is about twice the normal for a woman of her size; her weight had gone down to one hundred and fifteen pounds. There was hypertrophy of both sides of the heart, but no endocarditis on any of the valves. The aortic valve was normal in circumference. There was no apparent insufficiency so far as one could make out in the gross. The coronaries showed marked atheromatous changes with calcification. Both coronaries were markedly narrowed but there was no occlusion. That would apparently account for her angina. She had a very slight amount of failure. There was only a small amount of fluid in each chest, and there was no ascites or peripheral edema.

The kidneys weighed together but two hundred and fifty grams, about two-thirds the normal weight. When the capsules were stripped one could see a granular surface, the granules measuring about one or two millimeters. Microscopically the arterioles were almost completely obliterated by necrotizing arteriolitis. Both the gross and microscopic findings are quite characteristic of malignant vascular nephritis.

In addition to the petechiae, another interesting finding that was not suspected clinically was hemorrhage into the gastrointestinal tract without ulceration. The hemorrhage was present in the ileum and the whole large bowel but not in the duodenum or jejunum. These are the typical sites of hemorrhage in uremia.

There is a recent article by Jaffé and Laing of Chicago in the Archives of Internal Medicine* in which one hundred and thirty-six cases of uremia are reported with a discussion about the gastrointestinal lesions. In twenty-seven per cent of their cases gross hemorrhage without ulceration was present in the gastrointestinal tract. They believe that hemorrhage is the early stage of the true colitis, and that the bacterial action on the hemorrhage devitalizes the mucosa and produces necrosis and ulceration.

There were also petechial hemorrhages into the genitourinary tract, a finding which is fairly common in uremia.

A PHYSICIAN: Did the adrenals show anything postmortem?

DR. CASTLEMAN: No; they were normal in size. Microscopically there was no evidence of necrosis or other effect from the radiation.

A PHYSICIAN: Do they ever x-ray the pituitary in these cases too?

DR. BREED: The positive results are much more frequent in x-ray of the pituitary than the adrenal.

*Jaffé, R. H. and Laing, D. R. Changes of the Digestive Tract in Uremia. Arch Int. Med., 53: 851 (June) 1934.

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Journal of Medicine

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THE MEETING OF THE AMERICAN COLLEGE OF SURGEONS

THE American College of Surgeons has published the Program for its meeting here in October, the Annual Clinical Congress and Annual Meeting.

The size and scope are striking, eighteen pages of program, largely fine print, for less than a week of intensive showing, predominantly of actual work in clinical surgery.

One cannot review a program, but some mention is fitting, for the event is important to us, not only for the magnitude of the program, but also in that it brings many men and much learning to Boston, wherefrom we profit, still more because it brings Boston before a large National audience, to our increased reputation; most of all, perhaps, because it concentrates our resources, mobilizes the profession, trains its personnel to that collecting and proper presentation of data on which progress so greatly depends, emphasizing that careful case work and case study that is the groundwork of good modern medicine and surgery.

Boston's reputation professionally rests as much on the quality of such work done and presented as on the quality of our schools.

Our reputation in this and other conventions for study, honest presentation, the minimum of personal exploitation, seems to be high in the country, which is one reason why these meetings come here and attract so many.

The College, rather elaborately organized, brings its own meeting here to a great degree, and it is the accepted policy that the evening meetings are to bring to us guests from all the United States and invited surgeons from abroad to speak to us, but the clinical part of the meeting is purely Bostonian, the organization of all that hospitals and schools can show is in Boston hands.

For this, local committees have been at work since the first of the year.

Dr. R. B. Greenough is President-Elect.

Dr. Arthur W. Allen is head of the Committee of Arrangements, Dr. Ernest M. Daland, Secretary.

The executive committee is composed of Drs. Arthur W. Allen, Ernest M. Daland, Alexander S. Begg, Horace Binney, David Cheever, Frederic J. Cotton, Robert B. Greenough, Frederick C. Irving, Fred B. Lund, Richard H. Miller, Frank Ober, and George L. Tobey.

The Hospital and School representatives are as follows:

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Charles F. Wilinsky
Philip D. Wilson
Edward L. Young, Jr.

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Scientific Exhibits: Robert B. Greenough, Chairman; Channing C. Simmons, Secretary.

Harvard Medical School Program: David Cheever, Chairman; Magnus I. Gregerson, Secretary.

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Clinical Bulletin: Frank Ober, Chairman.

Ophthalmology and Otolaryngology: George L. Tobey, Chairman; Lyman Richards, Secretary, Otolaryngology; Theodore L. Terry, Secretary, Ophthalmology.

Of much interest is the hospital program, with its daily meetings and conference on matters of hospital administration rather than actual surgery, of importance because of the great service of the college in raising and maintaining hospital standards, a vast service often taken for granted, of which we have heard too little hereabouts, much as we have profited by it.

This year fractures and traumatic surgery receive a great deal of demonstration in clinics, in papers and set exhibits.

The closely allied work on traumatic and industrial surgery comes in for much attention. Especial interest attaches to this in view of the recently issued bulletin of the Bureau on Industrial Medicine and Traumatic Surgery of the College which after eight years of study sets forth its report and recommendations.

This subject is closely bound up with the study of hospital service to the public—of some controversial interest because both in the bulletin above noted and in the report of the College's Committee on Health and Hospital Service, recently issued, the College once more reiterates its stand, adhered to from the beginning, for quality of service, for the utilization of trained, and, in certain instances, of specially trained men, a stand which has brought on the College certain rebukes, nowise likely to change this standard, or the stand taken by the College.

This is no place for discussion of the hospital program in detail.

One is, however, struck by the wide use of all Boston's medical facilities. Not only the surgeons perform, but also the schools and laboratories and the medical men and non-surgical specialists are enlisted to give broad presentation of matter in hand.

Of note also is the participation not only of the great metropolitan hospitals but of a very large percentage of the hospitals of Greater Boston and environs, a measure of real value not only in increasing the educational features of the exercises, but important in getting the staff together, busying them in studying case work and training them in presenting it.

Of especial interest are the projected meetings open to the public, frankly educational, in which the stress this year is to be on personal health, or as it has been put, not public health, but private health, stressing what surgical service means or can mean to each and every citizen.

STARTLING FACTS!

The Boston Evening Transcript of July 21 contains a quarter page advertisement by the Whiting Milk Companies under the above title, which is indeed startling; not so much on account of the facts presented as on account of certain statements made which are not generally accepted as facts, and on account of an overcommercialized flavor not usually considered in good taste where matters of health are concerned.

Dr. Shirley W. Wynne is quoted in his capacity of Health Commissioner of New York City, although as a matter of fact Dr. Wynne had not for some time been health commissioner at the time this advertisement was published. His statement, which speaks for itself, follows:

"You may not know, but it is a fact that this great nation of ours has the *highest maternal mortality of any civilized nation in the world.* More mothers die in childbirth per one thousand births in our great United States than in any other civilized nation. Something like *14,000 women lose their lives each year* from this cause in the United States.

"Authorities have said that probably fifty per cent of these deaths are preventable. I should go further and say that IF WE COULD ELIMINATE RICKETS PRACTICALLY 100% OF THOSE DEATHS COULD BE PREVENTED. (Sic.) The deformities of the bones that occur in early infancy are responsible for the deformed pelves of the mothers who die in childbirth."

The lesson to be derived from this remarkable statement is that one quart of Whiting's Irradiated Vitamin 'D' Milk every day contains sufficient Vitamin 'D' to protect your little girl against rickets and, by inference, from any possibility of a later death in childbirth. Mothers are further advised to see that dad, brother, sister, and baby each get their Irradiated Vitamin 'D' Milk every day, and it is recommended to fathers for that "all-in" feeling.

Irradiated milk, the merits of which, within reasonable limitations, we do not seek to deny,

seems thus to have entered at one fell swoop the ranks of the old line patent medicines—a move that will probably do it no good in the long run.

The amazing thing about this advertisement, however, which might otherwise pass simply as an example of poor taste with misstatement and overstatement of facts, is that it claims openly to be accepted by the American Medical Association, Committee on Foods, and by the Wisconsin Alumni Research Foundation.

Recent advice from the Committee on Foods of the American Medical Association, however, states that this particular advertisement was not passed on by the Committee or by the Wisconsin Alumni Research Foundation.

POLIOMYELITIS

In view of conflicting opinions concerning the etiology of poliomyelitis and the efficacy of serum and the respirator in its treatment, added value accrues to any critical review of the subject. Such a review has recently been published by Paul H. Harmon in *The American Journal of Diseases of Children* (47:1180 [June] 1934).

Recent investigation, according to Dr. Harmon, has failed to support the view of Flexner, Noguchi and Amoss that globoid bodies represent the active agent, and the proponents of the streptococcic etiology of the disease have not been able to marshal significant evidence to support their claims. The data, accordingly, are strongly in favor of a filtrable virus as the etiologic agent of the infection, even if conclusive evidence has not yet been produced.

Unfortunately the only practicable test of antiviral serum activity is the in vitro virus neutralization test that employs susceptible monkeys as indicators of the end-point of this serologic reaction, and the origin of a sample of serum is no direct guarantee that it contains neutralizing substance. In fact, many samples of human convalescent serum have been found not to contain the neutralizing substance, while normal serum has frequently been found to be as potent as the convalescent serum. Serum obtained a few months to a year after a paralytic attack is more likely to be potent than that obtained only days or weeks after the infection. There is also evidence tending to show that persons recovering from a mild attack produce more potent neutralizing serum than those with widespread paralysis or those who have received treatment with serum. Some authors believe that the blood group is as important a factor as a paralytic attack of the disease.

There seems to be about equal experimental evidence in favor of all four types of serum that have been used: the antistreptococcus horse serum of Rosenow, Nuzum and Willy; the antiviral animal serums of Pettit and others, and both convalescent and normal human serum, and only clinical trial can settle the question of the supremacy of any one type.

Apparently favorable results of treatment applied in the preparalytic stage may well be due to the fact that many cases regarded as preparalytic are in reality nonparalytic; Harmon collected the statistics of 531 untreated patients with preparalytic poliomyelitis and found that 380 or 71.5 per cent never developed paralysis at any time. Kramer and his associates and Park conducted experiments giving serum to alternate patients, and showed no difference in the average outcome between treated and untreated patients.

Despite the failure of statistical results in serum therapy, however, Harmon concedes value to the clinical observations that have been made of rapid symptomatic response to the administration of serum and, other forms of therapy, with the possible exception of spinal drainage, having been failures, concludes that there is enough clinical evidence to warrant the continued use of serums in early stages of acute poliomyelitis.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Edsall, Geoffrey. M.D. Harvard University Medical School 1934. His subject is "Biological Actions of Dinitrophenol and Related Compounds: A Review." Page 385. Address: Hammond Street, Chestnut Hill, Mass.

McLellan, Philip G. A.B., M.D. Harvard University Medical School 1925. F.A.C.S. Assistant Surgeon, Hartford Hospital. His subject is "Chronic Empyema with Bronchial Fistula Cured by Tidal Drainage." Page 390. Address: 683 Asylum Street, Hartford, Conn.

Levy, Robert L. M.D. Johns Hopkins University School of Medicine 1913. Associate Professor of Clinical Medicine, College of Physicians and Surgeons of Columbia University. Associate Attending Physician, Presbyterian Hospital, New York. His subject is "Management of the Patient with Anginal Pain." Page 392. Address: 31 East 72nd Street, New York, N. Y.

Peterson, Genevieve. B.S. Her subject is "The Social Aspects of Diabetes: A Study of Sixty Cases." Page 397. Address: The Mayo Clinic, Rochester, Minn.

Miller, James Raglan. A.B., M.D. Johns Hopkins University School of Medicine 1911. F.A.C.S. Assistant Obstetrician and Gynecologist, Hartford Hospital, Hartford, Conn. Consulting Gynecologist, Bristol (Conn.) Hospital,

Windham County Memorial Hospital, Neuropsychiatric Institute and Hospital of the Hartford Retreat. His subject is "Carcinoma of the Cervix Uteri with Eight Months' Pregnancy." Page 402. Address: 179 Allyn Street, Hartford, Conn.

SALTZSTEIN, HARRY C. Ph.B., M.D. Johns Hopkins University School of Medicine 1914. F.A.C.S. Surgeon, Detroit, Michigan. His subject is "The Case for Group Practice." Page 405. Address: 1056 Maccabee Building, Detroit, Michigan.

PALMER, GEORGE T. B.S., S.B., M.S., Dr.P.H. University of Michigan. Secretary, New York City Board of Health, 1934. Director of Research, American Child Health Association 1923-1933. Epidemiologist and Deputy Commissioner, Detroit Department of Health 1919-1923. Address: 139 Centre Street, New York City. Associated with him is

DERRYBERRY, MAYHEW. B.A., M.A., Ph.D. New York University 1933. Associate Director of Research, School Health Study, American Child Health Association 1926-1934. Associate Director of Research Service, American Child Health Association 1934-. Address: 50 West Fiftieth Street, New York City. Their subject is "Medical and Public Health Attitude Toward Smallpox Vaccination and Diphtheria Immunization." Page 413.

MESERVE, FAITH L. B.A., M.D. Boston University School of Medicine 1926. Visiting Physician, Contagious Service, Waltham Hospital. Her subject is "Manifestations of a Streptococcus Infection." Page 415. Address: 247 Boston Post Road, Weston, Mass.

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JULY, 1934

Anterior poliomyelitis morbidity figures show nothing unusual to date.

Diphtheria, pulmonary tuberculosis and tuberculosis other forms had their lowest reported July incidence.

Lobar pneumonia and whooping cough were reported somewhat above the five-year average for the month.

After nine months of increased incidence, the measles morbidity dropped sharply to below the five-year average for July.

Typhoid fever, scarlet fever, chicken pox, mumps, and epidemic cerebrospinal meningitis show nothing remarkable.

RARE DISEASES

Anterior poliomyelitis was reported from Boston, 1; Cambridge, 1; Everett, 1; Fall River, 1; Greenfield, 1; Holyoke, 2; Ipswich, 1; Leominster, 2; Lynn, 1; Melrose, 1; Newton, 2; Springfield, 1; Stoughton, 1; Walpole, 1; Wareham, 1; Watertown, 1; Worcester, 1; total, 20.

Anthrax was reported from Peabody, 1.

Dysentery (amebic) was reported from Worcester, 1.

Dysentery (bacillary) was reported from Arlington, 1; Chelsea, 1; Danvers, 3; Milford, 1; total, 6.

Encephalitis lethargica was reported from Lawrence, 1; Quincy, 1; total, 2.

Leprosy was reported from Westfield, 2.

Malaria was reported from Chelsea, 1; Framingham, 1; total, 2.

Cerebrospinal meningitis was reported from Boston, 4; Brockton, 1; Leominster, 1; total, 6.

Pellagra was reported from Boston, 1.

Septic sore throat was reported from Boston, 8; Cambridge, 1; Ipswich, 1; Lowell, 3; Northampton, 1; Quincy, 1; Somerville, 1; total, 16.

Trachoma was reported from Malden, 1.

Trichinosis was reported from Boston, 2; Brookline, 1; Gloucester, 1; total, 4.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

MONTHLY REPORT FOR JULY, 1934

Disease	July, 1934	July, 1933	Average*
Anterior Poliomyelitis	20	78	34
Chicken Pox	371	342	365
Diphtheria	43	66	148
Dog Bite	1405	733	684
Epidemic Cerebrospinal Meningitis	6	8	7
German Measles	25	35	51
Gonorrhea	559	580	551
Lobar Pneumonia	155	108	105
Measles	775	1164	1125
Mumps	207	208	245
Scarlet Fever	270	418	407
Syphilis	291	348	284
Tuberculosis (Pulmonary)	286	318	389
Tuberculosis (Other Forms)	44	50	52
Typhoid Fever	17	20	24
Undulant Fever	—	1	—
Whooping Cough	930	654	616

*Average number of cases for July for the preceding five years.

DEATH RATES BY OCCUPATION

What effect has a man's job on the length of his life? An answer to this question is offered by Miss Jessamine S. Whitney, Statistician, National Tuberculosis Association, in a report of a five-year study conducted under her supervision, and made public August 27 by the Association.

The highest death rate from all causes, for work-

ing men, fifteen to sixty-four years of age, was found among hostlers and stable hands, 36.22 deaths per thousand employed. The rate for garage laborers of the same ages was only 6.55. The rate for operatives in harness and saddle factories was 30.55; for aviators, 28.73; for operatives in cigar and tobacco factories, 19.32, which was also the rate found for boatmen, canal men and lockkeepers. Sailors and deck hands had a rate of 17.28. These may be compared with school teachers, with a rate of 4.42, and social and welfare workers, with a rate of 2.75, or with the rate for all "gainfully employed males," aged fifteen to sixty-four, of 8.70 per thousand. In the public service, guards, watchmen and doorkeepers died at the rate of 20.25 per 1,000. Firemen showed a rate of only 6.71. General laborers in the public service had a rate of 7.15, but garbagemen were found to have an index of 11.39. The rate for postmasters was higher than that for mail carriers, the figures being, respectively, 11.00 and 6.10.

Other comparisons taken from the report are as follows: lawyers, judges, and justices, 7.89; physicians and surgeons, 10.69; clergymen, 10.33; cemetery keepers, 6.50; college presidents and professors, 2.69. Rates for laborers in the chemical and allied industries were low at 5.13, and laborers in soap factories, 3.29, while for inventors, the rate is 17.65 and for draftsmen 3.21. Managers and officials of real estate companies have a rate of 5.64, but for real estate agents it is 10.09. Chauffeurs and truck and tractor drivers, 6.19; draymen, teamsters and carriage drivers, 17.59; telegraph operators, 10.09, and telephone operators, 4.59.

The report, entitled, "Death Rates by Occupation," contains eight thoroughly detailed and comprehensive tables, accompanied by interpretative comment. One of these tables shows death rates for various occupations by broad age groups, according to cause of death. Suicides among lawyers, judges, and justices are less than the average for all gainfully employed males included in the study; among doctors, suicides are greater. Unskilled workers kill themselves in greater proportion to their numbers than professional men, and agricultural workers less than semi-skilled workers in other pursuits. Tuberculosis takes its greatest toll among unskilled workers, whose rate is double the average for all workers; the rate for skilled workers is a little under the average; while professional men have a rate less than one-third of the average. After the age of forty-five, heart disease claims more than the average of professional men; but the rate for agricultural workers is only half the average, and unskilled workers again seem to get the worst of it from heart disease, with the highest rate, for both the twenty-five to forty-four and forty-five to sixty-four age groups.

Some of the other diseases for which detailed rates are given in the tables accompanying the report are cancer and other malignant tumors; nephritis; cerebral hemorrhage; diabetes; cirrhosis of the liver; and accidents.

The importance of the study is pointed out as follows: "Without accurate data as to the relative health risk of various occupations, no one knows where to expend the greatest effort in industrial health work. Each industry has come to realize that certain of its occupations are more hazardous than others. Employees in dusty trades, those usually exposed to high temperature or to excessive moisture, or to bad weather conditions generally, are among the workers subjected to the greatest risk. That a certain occupation may be hazardous may be a recognized fact. But how hazardous is it? How much more dangerous is it than other occupations in the same or other industries?"

Many difficulties were surmounted in obtaining the facts contained in the final report, which is based on data of the United States Census Bureau. The principal obstacle encountered was that the death certificates did not disclose occupations in a satisfactory manner for such a study. Another was the frequent discrepancy between the method of classifying occupations on death certificates and census returns, so that a comparison of the number of deaths with the number of persons employed in a given occupation was difficult. Beginning in 1929, an effort was made throughout the United States to obtain uniform reporting of occupations on death certificates, and it was found that ten states, for the year 1930, had their vital statistics in a condition to make studies of them significant. These states were Alabama, Connecticut, Illinois, Kansas, Massachusetts, Minnesota, New Jersey, New York, Ohio and Wisconsin. The total population for these states comprised 38 per cent of all that for continental United States.

"Another difficulty inherent in studies of occupational mortality," states Miss Whitney, "is the tendency to change occupations on the part of workers whose health becomes impaired or who are growing old. The machinist who becomes a forester after he contracts tuberculosis, and the boiler maker who gets a job as watchman when he grows older, cannot be properly evaluated in any analysis based on census statistics. Only through the intensive study of small groups obtained by the sampling process can this tendency to change occupations be taken into account.

"Not only is one's chance of survival affected by the hazard directly inherent in the job, as in the case of metal filers and zinc miners, etc., but there is, too, the effect of social or economic status or of different standards of living, as implied by certain occupations. For example, the lowest rate from tuberculosis is found in the highest economic bracket, and the rates increase steadily through the other social-economic groups (with the exception of agricultural workers), the highest tuberculosis death rate occurring in the lowest social-economic group."
—*National Tuberculosis Association.*

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1933 AND SEVEN YEAR AVERAGE

MONTH ENDING AUGUST 18, 1934

Diseases	1934 Week ending July 28	1934 Week ending August 4	1934 Week ending August 11	1934 Week ending August 18	Average cases reported for week corresponding to August 18 for past seven years	1933 Week ending July 29	1933 Week ending August 5	1933 Week ending August 12	1933 Week ending August 19
Cerebrospinal Men.	—	—	1	—	—	—	—	—	—
Chickenpox	12	14	8	5	8	26	9	7	14
Conjunctivitis Inf.	1	—	—	—	—	—	—	1	—
Diphtheria	—	2	3	2	7	4	3	2	1
Dysentery Bacillary	1	—	1	—	—	—	1	—	—
Encephalitis Epid.	—	—	1	—	—	—	1	1	—
German Measles	2	1	3	—	1	2	—	1	—
Influenza	—	—	1	1	—	2	4	3	1
Malaria	—	—	—	1	—	—	—	1	—
Measles	32	32	16	10	31	22	25	10	9
Mumps	13	14	4	7	5	15	12	4	4
Paratyphoid Fever	2	—	2	—	—	—	—	1	—
Pneumonia (Broncho)	5	5	4	2	5	6	9	2	6
Pneumonia (Lobar)	3	6	4	2	8	9	15	8	9
Poliomyelitis	—	1	1	—	5	2	—	2	4
Scarlet Fever	9	4	3	3	12	14	13	12	12
Septic Sore Throat	2	—	1	—	—	1	1	—	1
Tetanus	1	—	—	—	—	—	—	—	1
Trachoma	—	—	—	—	—	—	—	—	1
Tuberculosis (Pul.)	20	32	25	32	26	27	24	24	24
Tuberculosis (O. F.)	3	2	—	2	4	3	—	2	4
Typhoid Fever	2	3	3	1	4	2	3	3	2
Undulant Fever	1	1	—	—	—	—	—	—	3
Whooping Cough	80	53	43	35	44	52	20	34	21
Gonorrhea	60	63	30	36	32	21	13	65	38
Syphilis	68	61	28	61	38	46	25	31	33

Remarks: No cases of Asiatic cholera, glanders, plague or yellow fever during the past seven years.

RECENT DEATHS

ROBERTS—LINNAEUS ALTON ROBERTS, M.D., of 49 Brent Street, Dorchester, Mass., died at the Charlesgate Hospital, August 23, 1934. He was born in 1867 at Waldo, Maine. He graduated in medicine from the Dartmouth Medical School in 1893 and joined the Massachusetts Medical Society in 1895. He was a Fellow of the American Medical Association.

He is survived by his widow, Mabel (Webber) Roberts.

BOWEN — ALFRED PRESTON BOWEN, M.D., of 139 Chestnut Street, Lynn, Mass., died at his home, August 22, 1934. He was born in Lynn, the son of Joseph and Caroline Rea Bowen, in 1877. He graduated in medicine from the Harvard University Medical School in 1904 and was a member of the Massachusetts Medical Society from 1915 to 1921. He is survived by two brothers and a sister.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

August 18 - September 30—Medical Study Trip to Hungary. See page 975, issue of May 10.

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

September 10, 11, 12, and 13—American Congress on Physical Therapy will meet in Philadelphia at the Bellevue Stratford. For details write American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

September 10-15—First International Congress of Electro-Radio-Biology will be held in the Doges Palace at Venice. For details address the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio 173, Venice (Italy).

September 18, 19 and 20—Tenth Clinical Congress of the Connecticut State Medical Society. See page 287, issue of August 9.

September 27 and 28—International Association for Preventive Pediatrics will be held at Lyons. For details address the Secretary of the I. A. P. P., 15 rue Lévrier, Geneva (Switzerland).

September 28-29—New England Surgical Society will meet at Burlington, Vermont. For details address the Secretary, Dr. John M. Birnie, 14 Chestnut Street, Springfield, Mass.

October—International Medical Postgraduate Courses. See page 335, issue of August 16.

October 7-20—Sixth Annual Medico-Military Symposium, at the Mayo Clinic. See page 382, issue of August 23.

October 17 — William Harvey Society. Speaker: Dr. Emil Novak of Baltimore.

October 22 - November 2—1934 Graduate Fortnight of the New York Academy of Medicine. See page 1240, issue of June 7.

October 31 - November 2—Massachusetts State Nurses' Association, Hotel Statler, Boston. For information write Miss Helene G. Lee, R.N., 420 Boylston Street, Boston.

April 29 - May 3, 1935—The American College of Physicians will meet in Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

BOOK REVIEWS

Vital Cardiology. A New Outlook on the Prevention of Heart Failure. By Bruce Williamson. 294 pp. Baltimore: William Wood and Company. $5.00.

This volume begins with an exhortation on the futility of modern medicine, a denunciation of current emphasis on the recognition of murmurs and electrocardiographic changes, and a plea for the recognition of dysfunction at a time when preventive measures can effectively be applied. Attributing the greater incidence of mitral stenosis in females than in males to the greater activity of males after rheumatic infection, and citing the principle of active motion to prevent fibrosis as practised in other fields of medicine and surgery, the author would advise active exercise for a patient recently recovered from acute rheumatic fever and free of all evidence of activity of the rheumatic process. He holds that exercise means greater force of auricular systole and hence greater force in holding the mitral valve open and that it thus prevents the development of mitral stenosis. He fails, however, to support this theory with clinical data. The author then proceeds to point out that aortic stenosis is an extremely rare sequel of rheumatic fever; this he explains as the effect of the powerful left ventricular contractions in counteracting the cicatrizing process at the aortic valve ring. In most clinics of this country, however, aortic stenosis is being recognized as a fairly common lesion. To quote: "In regard to aortic incompetence other than that due to senile degeneration, we need not harbor the slightest fear that the healing process in the valve will lead to a stenotic obstruction."

The author expands his ideas on preventive cardiology by giving tachycardia as the indication *sine qua non* for digitalization regardless of whether other signs or symptoms of myocardial insufficiency have set in. Digitalis is regarded as having no place in the treatment of any heart with a slow ventricular rate. Any direct action of digitalis in increasing for any appreciable period the stroke volume or force of myocardial contraction is denied. Many recognized authorities at present will not be able to endorse these views.

That the ideas in this book are open to question from the point of view of modern pathology, physiology and therapeutics is attested by the following quotations, "The heart is governed bilaterally by this (the autonomic) system through two nerves—the sympathetic, which acts as the accelerator nerve, and the vagus, which is the depressor or conservator nerve — and only through the medium of these two nerves does the heart become aware of bodily activity and repose respectively." (Cannon has shown that the denervated heart still responds to various stimuli through the adrenals.) Again "A hypertrophied myocardium accompanying a valvular deficiency always has a better prognosis than a small heart under the same attending circumstances." And in discussing the treatment of coronary occlusion he states, "Another drug of great value is adrenalin given in 10 minim doses hypodermically four-hourly during the first few days where the blood pressure is low, whether heart block is present or not."

It is ever the duty of the medical profession to be sympathetic and even encouraging to new points of view, unorthodox though they may be. But to be worthy of consideration they must be founded upon accurate data. Because this is not true of the bulk of ideas set forth in this book, it can hardly be recommended.

Transactions of the American Association of Genito-Urinary Surgeons. Forty-fifth Annual Meeting. Volume XXVI.

This volume contains nearly thirty papers given at the 1933 meeting of the Association by leaders in American urology. Naturally the most valuable of these papers are those dealing with really important new subjects and fundamental principles. Included in this class is the paper of Caulk and Harris on the deep penetration of the electric current in prostatic resection, that of Hagner and Coleman on severe nephritis caused by roentgen ray therapy over the kidneys, that of Hugh Young on South American filariasis of scrotum and groin, the work of Lower et al. on testicular-pituitary endocrinology, and the paper of McCarthy and Ritter on the use of bacteriophage in urinary infections,—as well as various other papers. There are also a number of reports of rare and interesting cases, some of them with a review of the literature, which add to the total sum of medical knowledge and provide references to help with such cases when encountered. Other papers are on subjects already well understood. In some of these the subjects are presented particularly well, sometimes with an instructive point of view which makes them helpful. Taken as a whole, the volume is representative of the best urological work going on in America, where this specialty is further advanced than in any other country.